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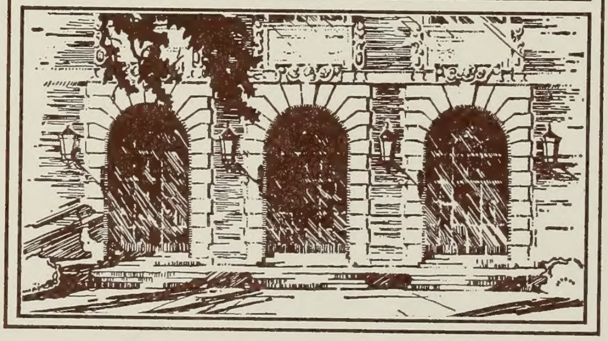

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Index Issue, 1970

GASTROENTEROLOGY ABSTRACTS AND CITATIONS

A monthly publication of the

National Institute of Arthritis and Metabolic Diseases

Editor

O. Dhodanand Kowlessar, M.D., Philadelphia

Associate Editor

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Literature Selected, Abstracted, and Indexed

by

The Franklin Institute Research Laboratories
Science Information Services
Biomedical Section

Dante S. LaRocca, Project Manager

for

Contract Number NIH-70-2040
with the PHS, USDHEW

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PREFACE

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The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great diversi of publications in the area of gastroenterology makes it imperative that an appropriate service be availabl investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim i to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comm for consideration whenever possible.

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. For journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans
Ar.	Arabic
Bul.	Bulgarian
Ch.	Chinese
Cz.	Czech
Dan.	Danish
Dut.	Dutch
E.	English
Eston.	Estonian
Fin.	Finnish
Fl.	Flemish
Fr.	French
Ger.	German
Gr.	Greek
Heb.	Hebrew
Hun.	Hungarian
Ic.	Icelandic
In.	Indonesian
It.	Italian
Jap.	Japanese
Kor.	Korean
Latv.	Latvian
Lith.	Lithuanian
Nor.	Norwegian
Pol.	Polish
Por.	Portuguese
Rum.	Rumanian
Rus.	Russian
Ser.	Serbo-Croatian
Sl.	Slovak
Sp.	Spanish
Sw.	Swedish
Th.	Thai
Turk.	Turkish
Uk.	Ukrainian
Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone
ADP	adenosine diphosphate
AMP	adenosine monophosphate
ATP	adenosine triphosphate
BSP	sulfobromophthalein
C	degrees centigrade
cm	centimeter(s)
CNS	central nervous system
cpm	counts per minute
DNA	deoxyribonucleic acid
e.g.	for example
g	gram(s)
µg	microgram(s)
hr	hour(s)
i.m.	intramuscular
i.p.	intraperitoneal
IU	international unit(s)
i.v.	intravenous
kg	kilogram(s)
LD_{50}	median lethal dose(s)
LDH	lactic acid dehydrogenase
m	meter(s)
M	molar
mEq	milliequivalent(s)
mM	millimolar
µM	micromolar
mC,µC	milli-,microcurie(s)
mg	milligram(s)
min	minute(s)
ml	milliliter(s)
mm	millimeter(s)
MTD	maximum tolerated dose
ng	nanogram (10^{-9})
pg	picogram (10^{-12})
p.o.	orally
ppm	parts per million
r	Roentgen
RBC	red blood cells (erythrocytes), red blood count
resp.	respectively
Rev.	review (only in citations)
RNA	ribonucleic acid
s.c.	subcutaneous
sec	second(s)
SGOT	serum glutamic-oxalacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
U	unit(s)
UV	ultraviolet
WBC	white blood cells (leukocytes), white blood count
yr	year(s)

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SPECIAL NOTICE

This January 1970 issue and subsequent issues of Volume 5 contain abstracts and citations from the current literature beginning approximately with December 1, 1969. The remainder of the 1969 issues (Volume 4) will contain abstracts and citations from the remainder of the 1969 literature not yet covered. Volume 4 should be complete by May 1970. Issues of Volume 5 will be published concurrently.

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

0001 ENZYME HISTOCHEMICAL STUDIES OF THE LIVER OF HUMAN EMBRYOS, FETUSES AND NEWBORN INFANTS. *(Jap.)* Kano, K. (Dept. Path., Osaka City U. Grad. Sch., Japan). *J Osaka City Med Ctr* 18(1-2): 37-64, 1969.

Histochemical studies by various techniques were made on the activities in the liver of the following 18 enzymes: Alkaline phosphatase, acid phosphatase (AcP), 5'-nucleotidase, non-specific esterase (E), cholinesterase (ChE), phosphorylase, 6-phosphogluconate dehydrogenase, glucose-6-phosphate dehydrogenase, succinate dehydrogenase, lactate dehydrogenase, β-hydroxybutyrate dehydrogenase, steroid 3β-ol dehydrogenase, DPNH-diaphorase, TPNH-diaphorase, cytochrome oxidase (CyO), monoamine oxidase, β-glucuronidase (β-Gluc), and leucine aminopeptidase (LAP). A positive reaction in the hepatic cells occurred for all the enzymes except PhR, LAP and ChE in the early embryonic period. The reaction became particularly intense from the 25th to the 40th week of gestation. There was a parallel relation between morphological development of hepatic cells and intensity of enzymatic activity. Activities of CyO, DPNH-diaphorase and TPNH-diaphorase and the dehydrogenases were particularly prominent. The development of enzymatic activity in the hepatic cells appeared to be complete by the 7th month of gestation. The majority of enzymes in the hepatic cells showed a fairly uniform distribution throughout the liver lobules; however, the more intense reactions occurred in the cytoplasm. Activities of AcP, E and β-Gluc were most intense in the pericanalicular cytoplasm, while the activity of 5'-nucleotidase was moderately intense in the nuclei of the hepatic cells. The epithelium of the interlobular bile ducts showed positive enzymatic activity from the 4th month of gestation onward.

0002 LOCALIZATION OF CARBOXYL GROUPS IN GASTRIC MUCOSA AS POSSIBLE SITES OF GASTRIN. *(E.)* Coatson, R. E. (U. Oklahoma Sch. Med., Oklahoma City). *Z Zellforsch* 101(2):241-253, 1969.

The cellular origin of gastrin in the human stomach was studied, utilizing cytological and histochemical procedures assumed or known to operate on a mechanism to detect carboxyl groups. General methods for acidic groups were combined with selective blocking (methylation) and unblocking (saponification) methods to increase COOH specificity. Epithelial cells with weakly metachromatic granules could be identified in untreated sections stained with toluidene blue (pH 5). After prolonged methylation and saponification, the same and previously obscured cells were moderately to intensely metachromatic, with this residual basophilia being attributed to weak COOH groups. Specifically marked metachromatic cells were iron-positive after colloidal iron staining, but were delineated easily only after methylation-saponification. Metachromatic cells were also clearly demonstrated by the carboxyl method of Barnett and Seligman and by silver impregnation (pH 5). The granular metachromatic cell demonstrated by these methods contains significant amounts of a weakly acidic component which the Barnett-Seligman reaction indicates to be glutamic acid. Comparable staining results were obtained with gastrin-producing Zollinger-Ellison islet cell adenomas. The COOH-rich substance is gastrin or gastrin precursor and the metachromatic cell is responsible for its production.

0003 ELECTRON MICROSCOPICAL STUDIES ON THE FUNCTIONAL MORPHOLOGY OF THE REGENERATING LIVER CELL AFTER PARTIAL HEPATECTOMY. *(Ger.)* Bader, G. (Pathol. Inst. Friedrich-Schiller-U., Jena, Germany). *Acta Hepatosplen* 16(5):281-297, 1969.

The morphological changes after subtotal hepatectomy in rat liver cells occurred in the following sequence and were paralleled by simultaneous biochemical and histochemical alterations: In the nucleus, loosening of chromatin (functional edema) was observed at 4 to 6 hr, postoperatively. The nucleoli increased in size and their nucleonema became more dense. The number of peri- and interchromatic granules increased and chromatin augmentation was noted after 12 hr. Normal conditions were re-established between 24 and 48 hr posthepatectomy. The smooth endoplasmic reticulum showed marked distension at 2 to 4 hr postoperatively. Endoplasmic reticulum proliferation was paralleled by increasing degradation of glycogen which disappeared between 6 and 12 hr and was resynthesized only after 24 hr. Normal contents of glycogen and smooth endoplasmic reticulum were reached after 3-4 days. The changes in granulated endoplasmic reticulum were multiple and included dissociation, new formation of ribosomes and of granulated membranes with normalization requiring one week. Edema in the matrix of mitochondria set in at 2 hr, continued until 10 hr and subsided at 24 hr. Microbodies increased in numbers but showed no morphological changes. Golgi fields showed marked distension at 12 hr with a simultaneous increase in Golgi vesicles. Normal structure of Golgi fields was restored at 24 hr.

0004 ELECTRON-OPAQUE INCLUSIONS IN ENTEROCHROMAFFIN CELLS OF MOUSE JEJUNUM. *(Ger.)* Linss, W. (Anat. Inst., Friedrich-Schiller-U., Jena, Germany). *Anat Anz* 125(4):432-442, 1969.

Occurrence of electron-dense inclusions was demonstrated by osmium fixation after administration of actinomycin, 8.0 μg/day i.p. for 8 days. The ultrastructure of the majority of these cells resembled that of liposomes. A smaller percentage of these inclusions showed different structural features including a distinct membrane and a non-homogeneous outer zone that contains electron-opaque and electron-transparent substances. The presence of serotonin in these inclusions was demonstrated by incubation with potassium dichromate.

0005 A HISTOCHEMICAL STUDY OF GUT MATURATION.

(E.) Williams, R. M. (London Hosp. Med. Coll., England) and F. Beck. *J Anat* 105(3):487-501, 1969.

Macromolecular expansion by the gut and its association with intracellular catabolism was investigated in the rabbit, rat, ferret and the guinea pig from late fetal stages to post weaning. Intracellular uptake of macromolecules, as marked by trypan blue, was found in the late fetal and pre-weaning phases of ileal epithelial development in the four species, ceasing at the time the animal can utilize food other than milk. Histochemical and biochemical studies of β-glucuronidase in the rat, rabbit and guinea pig ileum showed a marked correlation with the ingestive phase; very little enzyme activity was present following cessation of pinocytosis. However, acid phosphatase activity (using both azo dye and Gomori techniques) does not always correlate with pinocytosis either histochemically or biochemically. Biochemical assays for acid phosphatase in rats, rabbits and guinea pigs show no significant differences between neonatal and adult stages of development. Comparative histology and histochemistry of the neonate and adult intestine shows that they may be considered as two separate organs.

0006 FINE STRUCTURE OF RODENT COMMON BILE DUCT EPITHELIUM.

(E.) Yamada, K. (Nagoya U. Sch. Med., Japan). *J Anat* 105(3):511-523, 1969.

The fine structure of the epithelium lining the common bile duct was studied by light and electron microscopy in 30 Wistar rats, 15 BUA mice and 5 golden hamsters of mixed breed. The specimen was fixed in chilled buffered 2% osmium tetroxide solution, and embedded in Epon 812 or Epon-Araldite mixture. Sections for light microscopy were stained with alkaline toluidine blue. The cytoplasm of the duct epithelial cells of the rat is characterized by an abundance of microfilaments, relatively sparse cell organelles and a few presumed secretory vesicles, features which suggest little secretory activity. The cytoplasm in the duct epithelial cells of the mouse and hamster includes well-developed cell organelles and numerous electron-dense granules of secretion; the latter, thought to be mucinous in nature, appear to originate from the Golgi apparatus, accumulate in the apical cytoplasm and be discharged into the lumen by emiocytosis. A high level of secretory activity is presumably a device by which the epithelial cells protect themselves from being affected by concentrated bile from the gall bladder.

0007 BIOCHEMICAL AND HISTOCHEMICAL STUDIES ON THE DISTRIBUTION OF HISTAMINE IN THE DIGESTIVE TRACT OF MAN, DOG AND OTHER MAMMALS.

(E.) Lorenz, W. (Path. Inst., U. Munich, Germany), A. Schauer, St. Heitland, R. Calvoer and E. Werle. *Naunyn Schmiedeberg Arch Pharm Exp Path* 265(1):81-100, 1969.

Concentraion, distribution and storage of histamine, after administration of compound 48/80, were determined in tissues of the digestive tract of man, dog, pig, cow, and sheep, especially in the oral mucosa, stomach, gallbladder, and pancreas. Histamine was released from the frenulum linguae, soft palate, tongue, and thyroid gland of dogs, but not from the vestibulum oris, hard palate, pharynx, oesophagus, stomach, and pancreas in dogs. The release of histamine from the tongue showed regional differences and was lowest in the root and highest in the tip. Histamine content and the mast cell density in different parts of the tongue, stomach and in the soft palate were parallel in untreated dogs and dogs treated with 48/80. The mast cells in the gastric mucosa could be characterized by their staining properties as "atypical" mast cells, whereas those in the musculature of the tongue were "typical" mast cells. The histamine content of the single mast cell was similar in all tissues (3.2 pg/cell in the tongue, 3.3 in the stomach, 4.8 in the soft palate and 3.4 in the submaxillary gland). Only the mast cells in the fundic mucosa showed a significantly lower histamine content (1.9 pg/cell). The mast cells of the fundus and body of the stomach of the dog seemed to store histamine which was released by 48/80. A new classification of histamine stores is proposed: "unspecific mast cell stores" and "tissue specific stores".

0008 EFFECT OF CHOLINE DEFICIENCY ON THE GOLGI APPARATUS OF RAT HEPTOCYTES.

(E.) Estes, L. (U. Pittsburgh Sch. Med., Penna.) and B. Lombardi. *Lab Invest* 21(5):374-385, 1969.

Morphology of the Golgi apparatus of hepatocytes was studied with the electron microscope in rats fed a choline-supplemented (CS) or choline-deficient (CD) diet for 15-48 hr. In CS rats, the elements of the Golgi apparatus were very conspicuous, mainly due to an extensive dilation of the cisternae which were distended and full of slightly granular material of very low electron density. Small droplets of a similar material were present in numerous secretory vesicles. In CD rats, however, the Golgi apparatus cisternae appeared mostly as thin and empty spaces lined by smooth membranes. Fewer secretory vesicles were present. Lipid droplets of various sizes were observed in large numbers throughout the cells. There was also fragmentation and dilation of the cisternae of rough and smooth endoplasmic reticulum. The presence of an altered state of the membrane system of hepatocytes accounts for the defect in the intracellular transport and secretion of proteins by the liver of choline-deficient rats.

0009 DISTRIBUTION OF DIAMINE OXIDASE AND IMIDAZOLE-N-METHYLTRANSFERASE ALONG THE GASTROINTESTINAL TRACT. *(E.)* Kim, K. S. (George Washington U. Sch. Med., Washington, D. C.), B. Backus, M. Harris and P. Rourke. *Comp Biochem Physiol* 31(1):137-145, 1969.

Gastrointestinal distribution of diamine oxidase (DAO), imidazole-N-methyl transferase (IMT) and histamine was studied in male guinea pigs, male albino rabbits, male mice, Sprague-Dawley rats, female cats, and male dogs. Using ^{14}C-labelled putrescine as a substrate, DAO activity was increased in the small intestine, was decreased in the large intestine with the exception of the dog, and was practically absent in the stomach. In general, herbivores had lower DAO activity distribution than either omnivores or carnivores. Using ^{14}C-labelled S-adenosyl methionine as a methyl donor and histamine as a substrate, IMT activity was present all along the gastrointestinal tract with the exception of the rat stomach. In dogs, IMT activity was higher in the pyloric gland area than in the oxyntic gland area, but the reverse was found in rabbits and guinea pigs. IMT activity in the large intestine was lower than in the small intestine, except in the cat where it was equal. Both germ-free and normal rats showed similar DAO and IMT activity distribution in the small intestine.

0010 METABOLISM OF CHYLOMICRON CHOLESTERYL ESTER IN RAT LIVER: A COMBINED RADIOAUTOGRAPHIC-ELECTRON MICROSCOPIC AND BIOCHEMICAL STUDY. *(E.)* Stein, O. (Hebrew U. Hadassah Med. Sch., Jerusalem, Israel), Y. Stein, D. S. Goodman and N. H. Fidge. *J Cell Biol* 43(3):410-431, 1969.

Chylomicrons containing labeled cholesterol (mostly in the form of cholesteryl ester) were injected i.v. into intact rats, and samples of liver were obtained 27-210 min later. Most (58-75%) of the injected label was recovered in the liver after 27-75 min. Hepatic uptake occurred without hydrolysis of the labeled cholesteryl ester. In separate experiments, in vitro perfusion of livers of similarly treated rats for 30-35 min washed out only 3-9% of the labeled sterol. Samples of liver and small intestine were prepared for electron microscopy with Aquon as the dehydrating agent. Good retention (70% or more) of labeled cholesterol and satisfactory preservation of ultrastructure were obtained. After 30 min, the radioautographic reaction was localized mainly over the region of the cell boundary of the parenchymal liver cells, with fewer grains being present over intracellular organelles. At later time intervals, when considerable hydrolysis of the labeled cholesteryl ester had occurred, the radioautographic reaction was more evenly distributed. Phagocytosed labeled lipid was seen in Kupffer cells after the larger lipid load; phagocytosis by parenchymal cells was not seen. In other experiments, cholesteryl ester hydrolase activity was found in all subcellular fractions, with the microsome and plasma membrane fractions showing the highest activity per mg protein. The mechanism of cholesteryl ester transport into the liver cell may involve: (1) hydrolysis at the cell surface; or (2) slow entry of intact molecules followed by intracellular hydrolysis of the ester bond.

0011 PHOSPHOLIPIDS OF THE NUCLEI AND NUCLEAR MEMBRANES OF RAT LIVER CELLS: COMPOSITION AND METABOLISM. *(Fr.)* Lemarchal, P. (Cancer Res. Ctr., Villejuif, France) and M. Bornens. *Bull Soc Chim Biol* 51(6):1021-1046, 1969.

Cellular nuclei from rat liver were isolated and their double membrane extracted by means of citric acid with an estimated 65% yield and the phospholipids of the membrane fraction were analyzed. Phospholipid metabolism was studied after injection of ^{32}P into the animals at varying times prior to sacrifice. The results were compared to those obtained under similar conditions with intact nuclei and the final nuclei (those without membranes). The phospholipids of the membrane fraction amounted to 35% of the total phospholipids of the intact nucleus. Their composition in terms of phosphorus distribution among the main components closely resembled that of the phospholipids of the final nucleus, except in content of lecithins, polyglycerophosphatides and phosphatidylinositols. The fatty acids showed a higher degree of saturation in the phospholipids of the membrane fraction than in those of the final nucleus. The curves expressing specific activity as a function of time for each of the main phospholipid components in the membrane fraction and the final nucleus were practically identical. A dynamic equilibrium exists between phospholipids of the nuclear membrane and the interior of the nucleus and their synthesis proceeds at a comparable rate.

0012 STUDIES ON THE ULTRASTRUCTURE OF THE CHIEF CELLS OF RABBIT GASTRIC MUCOSA. *(Fr.)* Tusques, J. (no affil) *C R Ass Anat* (144): 1690-1700, 1969.

The characteristics of the chief cells in the greater curvature of rabbit stomach differed with the time and site of removal. Comparative examination of the different stages enabled detection of interesting new features in the elaboration of the zymogenic granules. Some cells contained no secretory granules, and their Golgi apparatus consisted of vesicles arranged in the form of a crown in the apical cell layers. The basal cell layers contained parallel rows of confluent sacs of ergastoplasm filled with clear granular material. Other cells contained secretory granules that were only partially surrounded by a membrane. The granular material was in contact with the ergastoplasm at the sites of membrane interruption, and their Golgi apparatus contained larger vesicles than that of the preceding cell type. A third form of chief cells was characterized by numerous round, very dense granules entirely without membrane and also connected with the ergastoplasm. In some cell forms, the density of these granules was greater in the apical portion of the cell than in the basal strata. Finally, there was a cell form consisting of a limited number of particularly dense granules located in the apical region in the vicinity of the Golgi apparatus. These cells had a double membrane and discharged granular material into the glandular lumen.

0013 ELECTRON MICROSCOPY OF THE CANALICULAR CYCLE IN THE "BORDER" CELLS OF RABBIT STOMACH. *(Fr.)* Tusques, J. (no affil) and G. Pradal. *C R Ass Anat* (144):1701-1709, 1969.

The morphology of the border cells of the fundic mucosa of rabbit stomach varied for a given animal with the time of removal and the location in the different parts of the greater curvature. Their appearance corresponded with different secretory phases and reflected the secretory cycle in temporal sequence. The morphological variations predominantly concerned the intracytoplasmic canaliculi and the microvilli which form their lining. Microcanaliculi were either completely closed (obstructed by long microvilli), slightly open (partially obstructed by long microvilli), or completely open (short microvilli). In all zones, the presence of a limited number of cells was noted that had wide-open canaliculi which were surrounded by an irregular membrane and usually contained no microvilli. canaliculi with a distinct lumen which contained numerous but much shorter microvilli than the preceding cell forms. Other canaliculi had even wider openings and contained fewer and smaller microvilli. In all zones, the presence of a limited number of cells was noted that had wide-open canaliculi which were surrounded by an irregular membrane and usually contained no microvilli.

0014 NUCLEASE ACTIVITY IN DIFFERENT SEGMENTS OF THE HUMAN DIGESTIVE TUBE COMPARED TO THE INCIDENCE OF CARCINOMAS (HISTOCHEMICAL STUDY). *(E.)* Fout, L. (Dept. Gen. Pathol. Neuropathol., U. Louvain, Belgium), H. S. Taper and J. M. Brucher. *Histochemie* 20(2):150-158, 1969.

Alkaline and acid deoxyribonuclease and ribonuclease activities in human biopsy digestive mucosal epithelium were histochemically compared to the statistical incidence of malignant tumors in the mucosal epithelium. Alkaline and acid nuclease activities were markedly increased above normal values in the small intestine mucosal epithelium where the incidence of carcinomas was low. Nuclease activities were decreased below normal values in stomach and large intestine mucosal epithelium where incidence of carcinomas was high. Decreased activity of nuclease in normal tissue may be a predisposing factor for malignant transformation.

0015 ELECTRON MICROSCOPIC STUDY OF MONOLAYER LEUKOCYTE CULTURES FROM PATIENTS WITH VIRUS HEPATITIS. *(Rus.)* Guschin, B. V. (Ivanovskii Virol. Inst., Moscow), I. F. Barinskii, G. A. Sinaiko, A. K. Shubladze and S. M. Klimenko. *Vop Virus* (5):556-561, 1969.

Leukocyte cultures from 5 children (age 5-14) with virus hepatitis exhibited structural damage to chromosomes in a large percentage of the cells. Virus-like particles (500-650 Å long and 400-500 Å wide), of spherical or oval shape consisting of 2 concentric membranes separated by a clear space and with the center poorly dispersing electrons, were found in cytoplasmic vacuoles. The vacuoles usually contained 2-3 particles, less frequently 1 or 5. Some particles were connected to the membrane lining the vacuole wall. These virus-like particles were not found in leukocytes from 2 healthy donors and 4 influenza patients.

0016 A CASE OF NIEMANN-PICK DISEASE: HISTOLOGICAL AND ULTRASTRUCTURAL FINDINGS IN THE LIVER. *(It.)* Miraglia Del Giudice, M. (Pediat. Clinic, U. Naples, Italy), L. Cuccurullo, G. Stoppoloni and G. Manocchio. *Pediatria* 77(3):391-422, 1969.

0017 ULTRASTRUCTURE OF THE GASTRIC MUCOSA. *(Sp.)* Perez-Iñigo, C. (Inst. Pres. Med., "Capitan Medico Ramon y Cajal") A. Valle and L. Diaz-Flores. *Med Cir Guerra* 31(9):411-419, 1969.

0018 EFFECT OF DIMETHYL SULFOXIDE ON EXPERIMENTAL CYTOSIDEROSIS. *(Sp.)* Weinstein, V. (Inst. Neurosurg., Santiago, Chile), E. Oberhauser, A. Asenjo, G. Rojas and L. Aranda. *Neurocirurgia* 27(1-3):56-60, 1969.

0019 CONTRIBUTION TO THE STUDY OF GASTRIC ACANTHOMA. HISTOMORPHOLOGICAL AND HISTOCHEMICAL FLUOROMICROSCOPICAL ASPECTS OF THE ENDOCELLULAR NUCLEIC ACIDS. *(It.)* Loreto, N. (Inst. Surg. Path., U. Rome, Italy). *Ann Ital Chir* 44(6):976-998, 1969.

0020 INNERVATION OF THE CECAL DIVERTICULUM IN RABBITS. *(Fr.)* Van Campenhout, E. (Inst. Anat. U. Louvain) and J. M. Jadin. *Ass Anat* (144):1717-1721, 1969.

0021 HISTOCHEMICAL OBSERVATIONS ON THE LIVER OF *GALLUS DOMESTICUS* IN COURSE OF DEVELOPMENT. *(It.)* Atzeri, G. (Inst. Normal Human Anat., U. Cagliari, Italy). *Rass Med Sarda* 72(2):125-138, 1969.

0022 ULTRASTRUCTURE OF RAT HEPATOCYTES IN EARLY STAGES AFTER CASTRATION. *(Pol.)* Królikowska - Prasal, I. (Med. Acad. Lublin, Poland). *Folia Morph* 28(3):323-334, 1969.

0023 HISTOCHEMICAL ALTERATIONS IN THE LIVER DUE TO THYROXINE AND METIZOLE ADMINISTRATION. *(Pol.)* Konecki, J. (Slaskiej Med. Acad., Katowice, Poland) and J. Kubacki. *Pol Arch Med Wewnet* 43(8):1144-1160, 1969.

0024 PERIPHERAL AND HEPATOSPLENIC RHEOGRAPHY "WITH AN INFINITE TIME CONSTANT". 1st NOTE: RHEOGRAPHY OF THE PERIPHERAL CIRCULATION (QUANTITATIVE FLUXOMETRY). *(It.)* Garini, G. C. (Inst. Clin. Med. Ther., U. Bologna, Italy) and T. Posteli. *Arch Pat Clin Med* 45(5):367-386, 1969.

0025 ILLUMINATING THE ULTRASTRUCTURE OF THE GLYCOPROTEINS IN THE DIGESTIVE CECA OF *SPHAEROMA SERRATUM (CRUSTACEA ISOPODA). (Fr.)* Donadey, C. (Fac. Sci. Marine Station, Marseilles, France). *C R Soc Biol* 163(4):895-898, 1969.

0026 A HISTOLOGICAL STUDY ON THE LYMPHATIC VESSELS IN THE WALL OF THE MOUSE SMALL INTESTINE. *(Jap.)* Ando, A. (Tohoku U. Sch. Med., Japan). *Acta Anat Nippon* 44(3):177-186, 1969.

See also: 0062 (P:Secr:Stom) • 0090,0091,0100 (P:Secr:Hepatobil) • 0160,0162 (P:Secr:Int) • 0182,0187,0190 (Diagproc) • 0358 (D:S.Intest) • 0529,0538 (D:Livbil) • 0602 (D:Livbil:Nonv.Hep) • 0633 (D:Livbil:V.Hep) • 0635 (D:Livbil:Cirrh)

0027 MICROPUNCTURE STUDY OF WATER TRANSPORT.

(E.) Lee, J. S. (U. Minnesota Med. Sch. Minneapolis). *Amer J Physiol* 217(5):1528-1533, 1969.

A procedure of micropuncture of intestinal villi for transport study is described. Transport into the central lacteal of the jejunal villi was investigated under various conditions. A segment of mucosal membrane was prepared from the jejunum of fasted (18-24 hr) male dogs and was bathed in a buffered Ringer solution (pH 7.55) containing 27.7 mM of glucose (osmolarity, 300mOsm). A micropipette was inserted in the central lacteal and transported fluid was collected using suction. The mean water transport rate of 43 villi was 134 ± 17 mμl/hr/villus. At 200 mOsm and 400 mOsm, the transport rates were 187 ± 31 mμl/hr, and 38 ± 14 mμl/hr resp. The rate did not change significantly when the proximal end of the villus was occluded, but no water transport occurred with occlusion of the terminal end. There was no correlation between the site of puncture of the villi and the transport rate. Water transport was dependent upon the presence of glucose and was reduced by 2,4-dinitrophenol in the bathing solution. Extrusion of cells from the center of the villous tip was always noted.

0028 TIME-FACTOR IN TRANSPORT OF PARTICLES BY JEJUNAL ABSORPTIVE EPITHELIUM. *(E.)*

Mohiuddin, A. (Coll. Med., Lagos, Nigeria) and M. S. Khan. *J Anat* 105(3):503-509, 1969.

Jejunal segments from adult white rats (fasted overnight) were exposed for 1,2,5 and 10 min to chyme obtained from the intestine of rats fed on buttered bread 90 min before sacrifice. Fat was visible in frozen sections stained with Sudan black in all samples. Collections of droplets appeared below the terminal web, in the apical Golgi vesicles. Fat globules also passed into extracellular spaces of the lamina propria. No material with the staining properties of fat was observed in the epithelial cells of fasted control specimens not exposed to chyme.

0029 ABSORPTION OF URINARY CONTENTS FROM ISOLATED SEGMENTS OF JEJUNUM AND ILEUM.

(E.) Rangel, D. M. (UCLA Sch. Med., Los Angeles, Calif.), Y. Yakeishi, G. H. Stevens and E. W. Fonkalsrud. *Surg Gynec Obstet* 129(6):1189-1198, 1969.

Absorption of electrolytes, urea, creatinine, and phosphate from urine and from a standard solution was studied in isolated pouches constructed from the proximal portion of the jejunum and the distal portion of the ileum of adult dogs. When urine of the dog or the standard solution was placed in the jejunal pouch, an increase in the volume of the contents and a rapid decrease in the tonicity toward isotonicity occur. In the ileal pouch, a decrease of the volume occurs concomitantly with a decrease in the hypertonicity. The concentration of chloride, potassium, urea, creatinine, and phosphate in both pouches changed toward osmotic equilibrium with plasma. When these values were corrected for changes in fluid volume in the isolated segments, a greater absorption,particularly of chloride, was measured from the ileal than from the jejunal pouch. Results suggest that the proximal portion of the jejunum of the dog is less likely to absorb urinary contents than is the distal portion of the ileum.

0030 ACTIVE ION TRANSPORT BY ISOLATED GASTRIC MUCOSAE OF RAT AND GUINEA PIG. *(E.)*

Sernka, T. J. (Dept. Physiol. Biophys., U. Iowa, Iowa City) and C. A. M. Hogben. *Amer J Physiol* 217(5):1419-1424, 1969.

Net flux of Na^+ and Cl^- through the gastric mucosa and stomach wall of the rat and guinea pig was determined when the electrochemical potential difference between the bathing solutions was zero. Mucosae generally exhibited greater net fluxes than did the corresponding stomach walls. The sum of the net flux of Na^+ and Cl^- approximated the short-circuit current when the mucosal solution was HCO_3^- buffered. Net flux through rat mucosae was greater using a HCO_3- buffered rather than an unbuffered or acid mucosal solution. A discrepancy between the sum of Na^+, Cl^-, and H^+ net flux and the short-circuit current demonstrated an active transport of K^+ from mucosa to serosa. Substitution of isethionate for Cl^- had no effect on Na^+ transport but choline substitution for Na^+ markedly depressed the active transport of Cl^-. The addition of ouabain to the serosal solution had no effect on the transport of Na^+ or on the membrane resistance but did decrease both the transport of Cl^- and the secretion of H^-. Mucosae and stomach walls of the rat and guinea pig actively transport $Na^+ + Cl^-$ ions; Na^+ is absorbed and Cl^- is secreted.

0031 EFFECT OF INTESTINAL MICROFLORA ON CALCIUM, PHOSPHORUS AND MAGNESIUM METABOLISM IN RATS.

(E.) Reddy, B. S. (Div. Biochem. Nutr., Lobund Lab., U. Notre Dame, Ind.), J. R. Pleasants and B. S. Wostmann. *J Nutr* 99(3): 353-362, 1969.

The effect of intestinal microflora on the absorption, excretion, retention and tissue distribution of calcium, phosphorus and magnesium was investigated in weanling germfree and conventional rats fed a steam-sterilized semipurified diet or a Millipore-filtered liquid diet for 15 days. Balance studies were carried out for 10 days. Neither germfree status nor the diets used appreciably influenced serum calcium, phosphorus and magnesium levels. Both germfree conditions and feeding of liquid diet increased apparent absorption of calcium and magnesium. There was no difference in phosphorus absorption, bu feeding of liquid diet resulted in higher absorption

Urinary excretion and net retention of both calcium and magnesium were increased in germfree rats. Urinary phosphorus excretion was decreased in germfree rats causing an increase in retention values. There was a higher calcium, phosphorus and magnesium concentration of the femur in germfree rats, but the ratios among these minerals were similar. No difference in the mineral composition of kidneys was observed. The presence of microflora in the gut may influence the metabolism of calcium, phosphorus and magnesium.

0032 INHIBITION OF STEADY-STATE INTESTINAL ABSORPTION OF LONG-CHAIN TRIGLYCERIDE BY MEDIUM-CHAIN TRIGLYCERIDE IN THE UNANESTHETIZED RAT. *(E.)* Clark, S. B. (St. Luke's Hosp. Ctr., New York, N.Y.) and P. R. Holt. *J Clin Invest* 48(12):2235-2243, 1969.

Triolein, a long-chain triglyceride, and trioctanoin, a medium-chain triglyceride, are hydrolyzed in the intestinal lumen of unanesthetized rats but the products of hydrolysis are metabolized differently by the mucosal cell. Intraduodenal infusion of trioctanoin reduced steady-state triolein absorption. Luminal lipolysis was not rate-controlling. High rates of trioctanoin infusion significantly lowered the pH of the luminal aqueous phase and altered the partition of oleic acid between aqueous and oil phases. Despite the significant inhibition of triolein absorption by high levels of trioctanoin, the maximum number of calories absorbed from mixtures of both triglycerides exceeded the maxima from either glyceride alone. The absorption coefficient for this lipid mixture was about 90%. Two possible mechanisms for inhibition of triolein uptake include: (1) in the intestinal lumen, medium chain lipids lowered the activity of oleic acid monomers in the aqueous phase and reduced passive diffusion into mucosal cells; (2) alternatively, competition between long and medium chain fatty acids for some common receptor during transport into the intestinal mucosal cell may have occurred. In patients who have a limited intestinal absorptive capacity, dietary fat intake may be doubled with a caloric supplement of medium-chain triglycerides without increase in steatorrhea by long-chain fat.

0033 INSULIN AND THE LIVER: II. THE INTESTINAL REABSORPTION OF BILIARY INSULIN. *(It.)* Greco, A. V. (Inst. Clin. Med., U. Sacro Cuore, Rome, Italy), L. Antico, G. Ghirlanda, G. Fedeli and G. Gambassi. *Chir Pat Sper* supp. to 16(5):20-6, 1968.

The possible intestinal reabsorption of insulin which reaches the digestive tract by way of the bile was investigated in cats. Prior to the experiment, basal insulin determinations by radioimmunoassay were made in blood obtained by catheterization from the femoral artery and vein, and from the anterior mesenteric vein. Subsequently, the animals received an injection of hypertonic glucose (1.0 g/kg) into the femoral vein and insulin determinations were repeated at 20, 60 and 120 min intervals. After 120 min, insulin was also measured in portal blood and hepatic and gall bladder bile: Basal insulin levels in the anterior mesenteric veins did not exceed those in femoral vein and artery; 20 min after i.v. glucose, insulin concentrations in the anterior mesenteric vein were lower than in femoral vein and artery; after 60 and 120 min, insulin levels in the three vascular beds no longer differed; greater amounts of insulin were present in hepatic bile than in serum; more insulin was present in the portal vein than in the femoral artery; and the concentration of insulin in gall bladder bile was higher than in the other areas examined. These findings are not consistent with hypotheses postulating that insulin may cross the intestinal barrier and undergo an enterohepatic cycle.

0034 EFFECT OF LACTOSE ON CALCIUM ABSORPTION AND EXCRETION IN THE RAT DIGESTIVE TRACT. *(Pol.)* Michalska, L. (Acad. Med., Gdansk, Poland). *Acta Biol Med* 13(1):49-73, 1969.

0035 CALCIUM AND THE DIGESTIVE TRACT: 2. INFLUENCE OF DISEASES OF THE DIGESTIVE TRACT ON CALCIUM ABSORPTION. *(Cz.)* Kocián, J. (Prague, Czechoslovakia). *Cesk Gastroent Vyz* 23(6): 269-279, 1969.

0036 COMPARTMENTAL ANALYSIS OF XYLOSE INTESTINAL ABSORPTION IN RABBITS AND OF THE EFFECT OF VARIOUS DRUGS. *(E.)* Giorgi, G. (Inst. Pharmacol., U. Siena, Italy) and G. Segre. *Farmaco (Sci)* 24(10):905-913, 1969.

0037 INTESTINAL CALCIUM ABSORPTION: NATURE OF DEFECT IN CHRONIC RENAL DISEASE. *(E.)* Avioli, L. V. (Washington U. Sch. Med., St. Louis, Mo.), S. Scott and S. W. Lee. *Science* 166(3909): 1154-1156, 1969.

See also: 0037 (D:Stomduo) • 0404 (D:S.Intest:Malabs) • 0582 (D:Livbil:Nonv.Hep)

0038 EFFECT OF NaCl ON THE PERISTALSIS OF THE ISOLATED GUINEA-PIG ILEUM. *(E.)*

Beleslin, D. B. (Dept. Pharmacol., Beograd, Yugoslavia). *Experientia* 25(10):1047, 1969.

A modified Trendelenberg method was used to study the effect of NaCl on the peristalsis of the isolated guinea-pig ileum. The intestine was suspended in Tyrode solution (36°C) and peristalsis was stimulated by neostigmine (25 ng/ml) for 30 min. Spontaneous activity reappeared after neostigmine was washed from the bath. An excess of NaCl (205-308 mM/liter) was added, and after 1 hr neostigmine (25 ng/ml was again added for 30 min. Samples were drawn after each 30 min. period and acetylcholine released in Tyrode solution and acetylcholine tissue content were assayed. Excess NaCl blocked peristalsis in the isolated ileum after a transient stimulant effect. During peristaltic block, after 1 hr of exposure to excess NaCl, the acetylcholine release was reduced by about 50%, while its tissue content did not change significantly. In additional experiments, acetylcholine applied to the bath during peristaltic block was without effect on the block.

0039 IONIC BASIS OF INTESTINAL ELECTRICAL ACTIVITY. *(E.)*

Job, D. D. (Dept. Physiol. Biophys., U. Illinois, Urbana). *Amer J Physiol* 217(5):1534-1541, 1969.

The ionic basis of intestinal slow waves and action potentials was studied in cat intestinal muscle by utilizing a rapid-collection technique which allows the collection of many fractions of radioactively-labelled (^{24}Na, ^{42}K, ^{45}Ca and ^{14}C-insulin) perfusate during one slow wave cycle. The efflux of sodium ion was maximal early in the repolarizing phase of a slow wave and the influx was maximal during the depolarization phase. The efflux of potassium ion was maximal during the late component of the slow wave whereas the influx did not deviate from random distribution. In the absence of spikes, calcium ion fluxes could not be correlated with any particular phase of the slow wave; in the presence of spikes, calcium fluxes were more definitive. The effects of temperature variation and conductance inhibitors indicate that slow wave amplitude and sodium pump activity are metabolically driven. The repolarization phase of intestinal slow waves was attributed to an electrogenic sodium pump and the depolarization phase to passive sodium influx.

0040 ACTIONS OF ATROPINE, TROPENZILINE AND N-BUTYL HYOSCINE BROMIDE ON THE ISOLATED DISTAL COLON OF THE GUINEA PIG: A COMPARISON OF THEIR ACTIVITIES AND MECHANISMS OF ACTION. *(E.)*

Lecchini, S. (Dept. Pharmacol., U. Pisa, Italy), M. Del Tacca, G. Soldani, G. M. Frigo and A. Crema. *J Pharm Pharmacol* 21(10):662-667, 1969.

The activities of atropine sulfate, tropenziline and N-butyl hyoscine bromide on the responses of the guinea-pig colon to acetylcholine (ACh) and to pelvic and transmural stimulation were compared. The distal colons were removed together with the pelvic nerves of 150 adult female guinea pigs. To stimulate the pelvic and intramural nerve, pulses with 1 msec duration and a frequency of 10 Hz were applied for 30 sec. Transmural stimulation was 20 volts. Acetylcholine concentration was 1 x 10^{-7}g/ml. In the ACh release experiments, the colon was incubated for 40 min with physostigmine sulfate (1 x 10^{-5}g/ml); drug concentrations causing a 60% reduction of the response to pelvic and transmural stimulation were used. Using ACh, transmural and pelvic stimulation, the resp. ED_{50} values (heights of contractions produced after drug treatment expressed as percentages of control contraction) were as follows: for atropine, 2.59 x 10^{-9}M, 5.41 x 10^{-9}M and 9.95 x 10^{-9}M; for tropenziline, 1.57 x 10^{-8}M, and 2.83 x 10^{-8}M, and 3.54 x 10^{-8}M; for N-butyl hyoscine bromide, 8.13 x 10^{-8}M, 1.15 x 10^{-7}M and 2.54 x 10^{-7}M. For all 3 substances, there was a linear relation between log dose and effect. Atropine reduced ACh release only during pelvic stimulation. ACh released by transmural stimulation was reduced 21% by tropenziline and 18% by N-butyl hyoscine bromide; that released by pelvic stimulation was reduced 25% by atropine, and 31% by each of the other 2 drugs. In 2 experiments, hexamethonium (1 x 10^{-4}g/ml) reduced the resting release of ACh by 39% and the amount released by pelvic stimulation by 49%. The reduced responses to tropenziline and N-butyl hyoscine bromide were explained by their ganglion blocking activity. Since atropine also releases ACh after pelvic nerve stimulation, it was suggested that muscarinic receptors of the parasympathetic ganglia are involved in transmission of pelvic nerve impulses.

0041 MORPHINE AS INHIBITOR OF PROSTAGLANDIN E_1 IN THE ISOLATED GUINEA-PIG INTESTINE. *(E.)*

Jaques, R. (Ciba Limited, Basle, Switzerland). *Experientia* 25(10):1059-1060, 1969.

Using previously described experimental conditions, prostaglandin (PGE_1) produced contractions of the isolated guinea-pig ileum or jejunum at concentraions as low as 0.1-0.3 ng/ml; arachidonic acid peroxide (AAP) produced contractions at concentrations 10-20 times higher. However, equieffective doses of PGE_1 (0.1 μg/ml) and AAP (0.3 μg/ml) were equally well antagonized by morphine (0.03 μg/ml). The ED_{50} values (μg/ml) of several compounds on PGE_1-induced contractions of the isolated ileum or jejunum were as follows: morphine, 0.01 ± 0.002; etonitazene, 0.000023 ± 0.000002; nalorphine, 0.014 ± 0.002; aminopyrine, no effect at 100 μg/ml; ethyl-3,5,6-tri-O-benzyl-glucofuranoside, 5.0 ± 0.40; atropine 0.34 ± 0.04; azemethonium, no effect at 100 μg/ml; tripelennamine 6.2 ± 0.08; fluoride (sodium), no effect at 30 μg/ml; and cyanide (sodium) 22 ± 2.8.

0042 MOTOR-EVACUATORY FUNCTION OF THE GALLBLADDER IN POSTGASTRECTOMY SYNDROMES IN ULCER PATIENTS. *(Rus.)*

Kuzin, M. N. (no affil), M. A. Chistova, Yu. M. Lopata and V. V. Sergeev. *Khirurgiia* 45(10):80-85, 1969.

Intravenous cholecystography in 51 ulcer patients following Billroth II operation revealed the presence of dumping syndrome in 24 patients, adducent loop syndrome in 17, and a combination of both syndromes in 10. The latent period of contraction of the gallbladder was decreased and the force of contraction was increased in these patients. These changes may be regarded as compensatory mechanisms for the rapid drainage of bile into the small intestine, but these compensatory changes are insufficient to provide adequate contact of food with bile, thus causing disturbance in digestion and assimilation of fats.

0043 EFFECT OF ESOPHAGEAL MUCOSAL DENERVATION ON THE MOTILITY OF THE CANINE ESOPHAGUS. *(E.)* Burgess, J. N. (Mayo Grad. Sch. Med., U. Minnesota, Rochester), K. A. Kelly, J. F. Schlegel and F. H. Ellis, Jr. *J Surg Res* 9(11):605-610, 1969.

Denervation of the mucosa of the distal portion of the esophagus and the gastroesophageal sphincter was performed in dogs, using a technique of mucosal neurolysis, manometry and cinefluoroscopy. A temporary motor disturbance (1 to 3 months), characterized by regurgitation of solids, weight loss, and replacement of peristalsis with simultaneous-premature contractions of the distal esophagus in response to swallowing (with "rebound" of a portion of the swallowed bolus), was found in all dogs with mucosal neurolysis and in none of the controls. However, no abnormalities were noted in any dogs in the motility of the gastroesophageal sphincter. Mucosal sensation is needed for peristalsis in the body of the esophagus, but does not contribute to the normal motility of the inferior esophageal sphincter.

0044 MOTOR FUNCTION OF THE STOMACH IN THE IMMEDIATE POSTOPERATIVE PERIOD. *(Rus.)* Sikor, Z. G. (no affil). *Khirurgiia* 45(10):76-80, 1969.

Motor peristaltic function of the stomach, measured by a modified electrogastrographic technique of Sobakin, was studied in 40 patients immediately following resection of 2/3 to 4/5 of the stomach. Wave voltage was reduced in the majority of patients immediately following resection. Strength of electric potential was decreased prior to and after resection in patients with pyloric stenosis. Amplitude of biopentials was decreased after resection of the distal portion of the stomach, indicating reduced motor function. Peristalsis in the resected stomach resumed on the 3rd to 5th day, postoperatively, and became rhythmic on the 7th to 9th day. The force of electric potential of the gastric stump became normal in 20 patients one year after resection.

0045 GASTRIC EMPTYING OF WATER AND GLUCOSE SOLUTIONS IN THE NEWBORN. *(E.)* Husband, J. (Guy's Hosp. Med. Sch., London, England) and P. Husband. *Lancet* II(7617):409-411, 1969.

The rates of gastric emptying of water and 5% and 10% glucose solutions were compared in 13 infants, using the technique of serial test meals administered between the 2nd and 60th day of life. The means of the volume of the meal (per kg of body weight) remaining in gastric aspirates were plotted against time, and regression lines were fitted for each solution. The higher the concentration of glucose solution, the slower the rate of gastric emptying at any given time. Although 10% glucose emptied at a slower rate than 5% glucose, more glucose left the stomach in a given time when the more concentrated solution was administered.

0046 PHARYNGOLARYNGOESOPHAGEAL AND GASTRODUODENAL MANIFESTATIONS IN STEINERT'S ATROPHIC MYOTONIA. *(Rum.)* Pendefunda, C. (Inst. Med. Pharmacy, Iasi, Hungary), L. Teodorescu, E. Memteanu, G. Lazar and T. Nanu. *Rev Medicochir Iasi* 73(3):569-575, 1969.

0047 ELECTROMANOMETRIC STUDIES OF NORMAL GUT AND MEGADOLICHOCOLONS AFTER USE OF DIHYDROERGOTAMINE METHANE SULFONATE. *(Fr.)* Duret, R. L. (U. Hosp., St. Pierre, Brussels, Belgium), P. Mainguet, M. Arguello and N. Douxfils. *Acta Gastroent Belg* 32(7-8):521-533, 1969.

0048 THE INFLUENCE OF TEMPERATURE ON THE SLOW POTENTIAL FROM THE SMOOTH MUSCLE OF THE STOMACH. *(E.)* Boev, K. (no affil) and M. Papazova. *Izv Inst Fiziol* 12(8):115-125, 1969.

0049 INTESTINAL ELECTRICAL ACTIVITY: A MEANS OF ASSESSING VIABILITY. *(E.)* Archampong, E. Q. (Ghana Med. Sch., Accra, Ghana) and S. Renis. *Postgrad Med J* 45(528):655-658, 1969.

0050 ON THE CONTRACTILE ACTIVITY OF THE LONGITUDINAL AND CIRCULAR MUSCULAR LAYERS OF THE STOMACH. *(E.)* Papazova, M. (no affil), E. Atanassova and K. Boev. *Izv Inst Fiziol* 12(8):103-114, 1969.

0051 BIOELECTRICAL ACTIVITY OF THE WALL OF THE COMPLEX STOMACH IN SHEEP. *(E.)* Radev, T. (Inst. Comp. Path. Animals, Bulgarian Acad. Sci.), M. Papazova, I. Stoyanov, and E. Atanassova. *Izv Inst Fiziol* 12(8):127-152, 1969.

0052 BULBAR INFLUENCE ON GASTRIC MOTILITY. *(E.)* Semba, T. (U. Hiroshima Med. Sch., Japan) and K. Fujii. *Jap J Physiol* 18(4):521-533, 1969.

0053 INHIBITION OF TONE IN THE TAENIA OF THE GUINEA PIG CECUM. *(E.)* Åberg, G. (AB Bofors Nobel-Pharma., Mölndal, Sweden), R. Andersson and I. Welin-Fogelberg. *Europ J Pharmacol* 7(3):296-299, 1969.

0054 A STUDY OF LARGE BOWEL PERISTALSIS IN MAN. *(E.)* Hardcastle, J. D. (London

Hosp., London, England) and C. V. Mann. *J Roy Coll Surg Edinb* 14(5):286-287, 1969.

0055 ANTI-PERISTALTIC DISPLACEMENT OF AN ILEAL LOOP WITHOUT TWISTING ITS MESENTERY. *(E.)* Rygick, A. N. (Moscow, USSR) and L. U. Nasarov. *Dis Colon Rectum* 12(6):409-411, 1969.

0056 COMPARATIVE SPASMOLYTIC POTENCIES OF ATROPINE SULFATE AND *N*-BUTYL HYOSCINE BROMIDE FOLLOWING INTRAVENOUS INJECTION, INJECTION INTO A MESENTERIC VEIN, AND INTRADUODENAL INSTILLATION. *(E.)* Bauer, R. (Dept. Pharmacol, C. H. Boehringer Sohn, Rhine, Germany) and H. Wick. *J Pharm Pharmacol* 21(10):706-708, 1969.

See also: 0428 (D:L.Intest) • 0528 (D:Pancreas:Pancreat)

057 STUDIES ON THE ANTIGENIC STRUCTURE OF HUMAN AND HOG INTRINSIC FACTORS. *(E.)* oldberg, L. S. (UCLA Dept. Med., Los Angeles), I. . Samloff and E. V. Barnett. *Clin Exp Immunol* (4):371-379, 1969.

he blocking and binding antibody response of abbits and goats immunized with hog intrinsic actor (IF) and rabbits immunized with human IF, ogether with autoantibodies to human IF, were sed to study the antigenic inter-relations of uman and hog IF. The blocking antibodies intercted with both the homologous (immunizing) and he heterologous IF, although antibody activity as greatest against the homologous IF. Only the abbit antiserum to human IF blocked all vitamin B_{12} ombining sites on homologous as well as heteroloous IF. Binding antibodies also reacted greatest ith homologous IF, and all, except for goat antiog IF, reacted to a lesser extent with heterologous F. Following immunization, blocking antibodies ere detected only in the IgG immunoglobulin fracion, whereas both IgG and IgM fractions contained inding antibody activity. Human and hog IF may ave similar, although not identical antigenic tructures; both contain two major antigenic deerminants, one located at the B_{12} combining site nd a second which is remote from this site.

0058 METABOLIC EFFECTS ON CHOLESTASIS PRODUCED BY OBSTRUCTION OF THE COMMON BILE DUCT IN RATS. *(Fr.)* Guerrin, F.(no affil), J. Baillet, J.P. Latreille, H. Robin and P. Lambert. *Lille Med* 14(8):880-888, 1969.

Rats with cholestasis induced by obstruction of the common bile duct, developed jaundice within 48 hr and subsequently died 8-12 weeks later. Cholestasis was characterized by metabolic acidosis, a significant increase in the levels of blood bilirubin, urea, and calcium and by the development of hypernatremia, hyperchloremia and hypokalemia. There was a marked increase in the values for serum transaminase and phosphatase and the pH of the gastric and intestinal mucus.

0059 MITOCHONDRIAL VULNERABILITY AND LIPID METABOLISM: BRAIN AND PANCREATIC MITOCHONDRIA. *(E.)* Ozawa, K. (Kyoto U., Fac. Med., Japan), O. Kitamura, T. Ohsawa, T. Murata and I. Honjo. *J Biochem* 66(3):361-367, 1969.

0060 THE EFFECT OF CYCLOHEXAMIDE ON TRANSLOCATION AND INCORPORATION OF LEUCINE AND LYSINE IN DUODENAL SACS. *(E.)* Tarver, H. (U. California Sch. Med., San Francisco) and E. Thompson. *Exp Biol Med* 132(1):321-322, 1969.

See also: 0043 (P:Motil) • 0260 (D:Esoph) • 0560 (D:Livbil)

0061 CLINICAL EXPERIENCE WITH PENTAGASTRIN.

(Ger.) Tillig, W. and G. Stein (no affil). *Med Klin* 64(44):2038-2043, 1969.

Pentagastrin, 6.0 μg/kg s.c., was well tolerated by a group of 50 patients including pregnant women. Peak acidity was observed 40-50 min after administration and was in good agreement with values following histamine stimulation. The peptide had no appreciable cholecystokinetic or choleretic action.

0062 ISOENZYME PATTERNS OF LACTATE DEHYDROGENASE IN THE NORMAL AND TUMOR-ADJACENT MUCOSA AND IN CANCER TISSUES OF STOMACH AND COLON.

(Ger.) Wolff, H.(Surg. Clin. Karl-Marx-U., Leipzig, Germany). *Arch Geschwulstforsch* 24(2-3): 188-197, 1969.

Isoenzyme patterns of lactate dehydrogenase are organ-specific and contain up to 5 fractions of different activities on dissociation by electrophoresis. Shifts in the activities of these fractions from anode to cathode have been regarded as an index of tissue alteration. Therefore, isoenzyme patterns of 68 resected cancers of stomach and colon were compared with those of 27 resected gastric and duodenal ulcers after electrophoresis. Isoenzyme activity in normal (non-ulcerous) mucosa of ulcer patients (upper third of the stomach) was highest in fractions I to III, with 77% of the total isoenzyme activity equally distributed between these fractions. Isoenzyme activity was lower in fraction IV and amounted to only 5% of the total activity in fraction V. In the normal mucosa of gastric cancer patients, the activity maximum was shifted toward the cathode and highest activity occurred in fractions III and IV. An even further displacement of isoenzyme patterns toward the cathode occurred in the mucosa adjoining the tumor. In cancer tissue, highest isoenzyme activity occurred in fraction IV. Similar findings occurred in the normal mucosa and in cancer tissue of the colon. Isoenzyme patterns may reflect a change in tissue metabolism that precedes or is secondary to tumor growth.

0063 EFFECT OF SC-15396, ATROPINE AND MEPYRAMINE ON GASTRIN-, BETHANECHOL- AND HISTAMINE-STIMULATED GASTRIC ACID SECRETION IN RATS AND GUINEA-PIGS.

(E.) Albinus, M. (Dept. Pharmacol., U. Tubingen, West Germany) and K.F. Sewing. *J Pharm Pharmacol* 21(10):656-661, 1969.

The effect of SC-15396 ('antigastrin'; 2-phenyl-2-(2-pyridyl) thioacetamide), atropine and mepyramine on gastrin-, bethanechol- and histamine-stimulated gastric acid secretion were studied in fasted, anesthetized male Wistar rats and guinea pigs. Gastric output was estimated titrimetrically with 0.01N NaOH using bromothymol blue as indicator. The drugs were infused i.v. for 15 min. For all 3 stimulants, parallel dose response curves were noted except in guinea-pigs, where bethanechol, even in very high doses (640 μg/kg), displayed a poor activity in stimulating gastric secretion. The maximal secretory response was 12.7 ± 5.7 μEq HCl/10 min in guinea-pigs. SC-15396 reduced all stimulating effects on gastric acid secretion, and atropine abolished the secretory responses to bethanechol, Mepyramine was ineffective.

0064 PENTAGASTRIN-INFUSION TEST AFTER ATROPINE OR VAGOTOMY.

(E.) Rowlands, C. (U. Coll. Hosp., London, England), J.M. Temperley and J.H. Wyllie. *Lancet* II(7616):348-349, 1969.

Gastric secretion was stimulated in 47 patients with dyspepsia by a 2¼ hr infusion of pentagastrin (6 μg/kg/hr). In 26 tests in which atropine was infused i.v. 1 hr before the end of the test in doses of 15,30 or 45 μg/kg/hr, the average level of secretion fell promptly. There was an average fall of 22% for mean volume, of 17% for acid secretion, and of 43% for pepsin secretion. The response to atropine was not dose related. Vagotomy in 9 patients had a significantly greater effect on acid secretion and mean volume than atropine. After vagotomy, the response to pentagastrin represented 44%, 30% and 49% of the preoperative values for volume, acid and pepsin, resp.

0065 EFFECT OF pH ON INTRINSIC FACTOR AND NON-INTRINSIC FACTOR VITAMIN B12 BINDING IN HUMAN GASTRIC JUICE NEUTRALIZED *IN VIVO*.

(E.) Taylor, K.B. (Stanford U. Med. Ctr., California), L.A. Ashworth, R.G. Strickland and N.C. Koo. *Gastroenterology* 57(5):506-510, 1969.

Intrinsic factor (IF) and nonintrinsic factor (NIF) vitamin B12-binding in human gastric juice, neutralized intragastrically, was quantified by immunoassay, and the effect of subjecting such juice to acid conditions similar to those under normal *in vivo* conditions was studied. There was a progressive decrease in both IF and NIF vitamin B12 binding with increasing exposure to an acid pH. Reduction in IF vitamin B12 binding occurred over a wide range of initial IF activity and was significant after 10-15 min exposure to an acid pH. An average reduction in IF activity of 20% after 15 min, increasing to 38% after 1 hr exposure, was observed. The vitamin B12 binding of partially purified human IF which did not possess peptic activity was not affected by acidification, indicating that the effect in gastric juice is probably a proteolytic one. The importance of attempting to eliminate autodigestive effects by the use of *in vivo* neutralization in any quantitative study of gastric IF secretion is emphasized.

0066 INTRINSIC FACTOR, NONINTRINSIC FACTOR VITAMIN B12 BINDER, AND PEPSINOGEN SECRETION IN NORMAL SUBJECTS: QUANTIFICATION USING INTRAGASTRIC NEUTRALIZATION AND INORGANIC PHOSPHATE AS A MARKER.

(E.) Taylor, K.B. (Stanford U. Med. Ctr., California), R.G. Strickland, L.A. Ashworth and N.C. Koo. *Gastroenterology* 57(5):511-517, 1969.

ntrinsic factor (IF) and pepsinogen secretion and on-specific vitamin B_{12} binder were quantified in normal subjects during maximal histalog stimulaion, utilizing continuous *in vivo* intragastric eutralization to overcome the partial intragastric egradation of IF. Phosphate buffer was used to chieve continuous intragastric neutralization and he inorganic phosphate in the buffer served as a astric marker. Differing patterns of secretion of hese three constituents were observed. The output f IF was not sustained and appeared to represent true washout phenomenon. The secretion of nonpecific vitamin B_{12} binder was not influenced by istalog stimulation. The pattern of pepsinogen ecretion clearly differed from that of IF and ppeared to be one of true stimulation. Data ndicate that this technique may have a wider appliation, particularly in the quantification of astric juice macromolecules which are susceptible o intragastric proteolysis and/or acid degradation.

067 CHARACTERISTIC OF INHIBITION OF GASTRIC SECRETION BY SECRETIN.

(E.) Johnson, L. . (V.A. Ctr., Los Angeles, Calif.) and M.I. rossman. *Amer J Physiol* 217(5):1401-1404, 1969.

ose-response relations of the inhibition by secrein of gastrin-stimulated acid secretion were tudied in four dogs with Heidenhain pouches and pen gastric fistulas. After establishing a onstant level of secretion from the Heidenhain ouches by infusing gastrin i.v. at a constant rate doses doubling from 0.1 to 1.6 g/kg/hr in various ests), secretin (doses doubling from 0.06 to 2.0 /kg/hr) was given by constant i.v. infusion for hr. From the dose-response curves to gastrin lone and gastrin plus 0.5 U/kg/hr secretin, ichaelis-Menton analysis was typical of noncometive inhibition. For maximal rates of gastrintimulated secretion, about 0.4 U/kg/hr of secretin as required for 50% inhibition and 1 U/kg/hr prouced maximal inhibition. In the dog, secretin is stronger inhibitor of gastrin-stimulated secretion han it is a stimulator of pancreatic secretion, ased on the observation that the dose required or 50% inhibition of gastric secretion was 0.4 /kg/hr, whereas the dose required for 50% maximal ancreatic stimulation was 1.2 U/kg/hr.

068 PEPSIN-PRODUCING CAPACITY OF THE GASTRIC MUCOSA UNDER THE EFFECT OF DOPA AND α-ETHYLDOPA.

(Rus.) Grechishkin, L. L. (Exp. Med. nst. Acad. Med. Sci., Lenigrad, U.S.S.R.). *armakol Toksik* 32(5):556-558, 1969.

ecretion, volume, acidity and pepsin content of astric juice and pepsinogen content in gastric ucosa were determined in fasted, gastric fistula ogs. Pepsin secretion was decreased and gastric ecretion was increased following i.v. infusion of istamine. Volume of gastric secretion and gastric cidity were not affected by i.v. infusion of α-methyldopa or dopa. Pepsinogen content of the gastric mucosa was markedly decreased by i.v. infusion of α-methyldopa, acetylcholine and histamine but was not affected by i.v. infusion of dopa.

0069 GASTRIC SECRETION IN THE CHRONIC FISTULA FERRET.

(E.) Pfeiffer, C.J. (Presbyterian-U. Pennsylvania Med. Ctr., Philadelphia) and C.M. Peters. *Gastroenterology* 57(5):518-524, 1969.

Gastric secretion was studied in conscious, vagally-innervated, chronic fistula ferrets in order to evaluate this carnivorous laboratory animal as a potential model for peptic ulcer and other gastric diseases. During basal, fasting conditions, the ferret secreted gastric hydrochloric acid and proteolytic enzymes. Fluid output averaged 1.7 ml/hr/ferret (2.9 ml/kg/hr) with an acid output of 757 μg/15 min. The histamine response was evaluated after i.p. administration of single doses of from 4.3 to 1080 μg of histamine base/kg. Doses of 33.5 and 67.3 μg/kg were potent stimulants of acid secretion. Larger doses greatly stimulated acid secretion, after an initial dose-dependent inhibition of secretion, which was presumed to be a toxic manifestation rather than a sign of dehydration. The maximal acid output following the optimal dose (67.3 μg histamine base/kg) was 0.29 mEq/kg/15 min, which compares with 0.46 and 0.35 mEq/kg/15 min previously reported for the dog and cat, respectively. Total protease output increased a maximum of 124% after histamine administration. The laboratory ferret appears to be well suited for gastroenterology research for the following reasons: (1) it is a basal secretor, as are man and the rat; (2) it is quite sensitive to histamine, like man and unlike the rat; (3) its gastric and intestinal morphology is similar to that of man but unlike that of the rat and (4) it is readily available as a mild-tempered, inbred laboratory species.

0070 GASTRIC SECRETORY RESPONSE TO CHRONIC HYPOTHALAMIC STIMULATION IN MONKEYS.

(E.) Hall, W.H. (U. Pennsylvania Sch. Med., Philadelphia) and G.P. Smith. *Gastroenterology* 57(5):491-499, 1969.

Gastric acid and pepsin secretions were studied under conditions of fasting and submaximal and maximal histamine stimulation in 5 gastric fistula rhesus monkeys receiving chronic bipolar electric stimulation of the hypothalamus. Increased acid secretion attributable to hypothalamus stimulation did not occur in 2 monkeys stimulated in the posterior medial hypothalamus. However, 3 animals stimulated in the anterior medial hypothalamus showed an increased sensitivity to submaximal doses of histamine, as evidenced by increased acid responses to submaximal stimulation without any change in the fasting acid output or maximal histamine response. The gastric acid-histamine dose-response curve apparently shifted to the left. This change occurred after a latent period of 5 days, was reversible, and was not accompanied by behavioral alterations or emotional displays. Measurements of body weight, food and water intake, plasma 17-hydroxycorticosteroids, plasma growth hormone, and gastric pepsin secretion failed to produce any correlates with the increased acid secretory response. The acid response to histamine may be increased by chronic brain stimulation, and this increased sensitivity of parietal cells to humoral stimulation is a reversible phenomenon.

0071 HISTIDINE DECARBOXYLASE IN GASTRIC MUCOSA OF VARIOUS MAMMALS. *(E.)* Aures, D. (UCLA Sch. Med., Los Angeles), W. D. Davidson and R. Hakanson. *European J Pharmacol* 8(1):100-107, 1969.

Histamine-forming enzymes in the gastric mucosa were assayed by the sensitive $^{14}CO_2$ technique in mice, rats, hamsters, guinea pigs, rabbits, cats, dogs, pigs and monkeys. Non-specific aromatic amino acid decarboxylase was present in the gastric mucosa of all animals studied. Gastric mucosa of many mammals was high in histamine content. Specific histidine decarboxylase activity was high only in the gastric mucosa of rats and mice and was activated by i.p. injection of pentagastrin or by re-feeding after a period of fasting only in the gastric mucosa of mice, hamsters and rats.

0072 INFLUENCE OF DIGESTIVE JUICES ON THE STABILITY OF DIGOXIN AND DIGITOXIN MOLECULE. *(Ger.)* Kasahara, K. (Clin. Westend Free U., Berlin, Germany) and A. Ruiz-Torres. *Klin Wschr* 47(20):1109-1111, 1969.

0073 ANALYSIS OF QUARTERON ACTION ON THE ADRENALINE AND NORADRENALINE CONTENT IN VARIOUS STOMACH LAYERS. *(Rus.)* Mirzoyan, S.I. (Erevan Med. Inst., Armenia, U.S.S.R.) and T.L. Virabyan. *Biull Exp Biol Med* 68(10):56-58, 1969.

0074 GASTRIC SECRETION AND PRESSURE IN THE GASTRIC CAVITY. *(Rus.)* Korotko, G.F. (Andizhan Med. Inst. U.S.S.R.) and A.M. Musaev. *Biull Exp Biol Med* 68(10):22-24, 1969.

0075 THE DETERMINATION OF GASTRIC JUICE PROTEOLYTIC ACTIVITY BY MEANS OF 131-ALBUMIN. *(Pol.)* Szybiński, S. *(Med. Acad. Cracow, Poland)* T. Horzela and S. Konturek. *Pol Przegl Radiol* 33(4):507-514, 1969.

0076 THE SECRETORY FUNCTION OF THE STOMACH IN WOMEN DURING AND AFTER LABOR. *(Rus.)* Umanskiy, S. Sh. (Obstetric Home #71, Tallin, Estonian SSR, U.S.S.R.), V.L. Shkodina and B.G. Temchine. *Akush Ginek* 45(9):62-65, 1969.

0077 STUDY OF THE ACTION OF THE ADRENOCORTICAL GLANDS ON THE PRODUCTION OF GASTRIC ULCERATION BY PROLONGED IMMOBILITY IN THE RAT. *(Rum.)* Sneer, A. (Inst. Med. F., Iasi, Rumania), M. Dinu, V. Stroia, E. Constantin and I. Nitulescu. *Fiziol Norm Pat* 15(4):307-316, 1969.

0078 A POSSIBLE REACTION TO PENTAGASTRIN. *(E.)* Aylward, M. (The London Hosp., London, England) and J.B. Bourke. *Lancet* (7614):267, 1969.

0079 EXCHANGE DIFFUSION IN ACID-FILLED GASTRIC POUCHES. *(E.)* Wlodek, G.K. (Dept. Surg., McGill U., Montreal, Canada), L. Greenberg and R. Lajzerowicz. *J Surg Res* 9(11):611-618, 1969.

0080 RADIOIMMUNOASSAY OF GASTRIN IN HUMAN SERUM USING ANTISERUM AGAINST PENTAGASTRIN. *(E.)* Young, J.D. (Garvan Inst. Med. Res., Sydney, Australia) D.J. Byrnes, D.J. Chisolm, F.B. Griffiths and L. Lazarus. *J Nucl Med* 10(12):746-748, 1969.

0081 IS SECRETIN ENTEROGASTRONE? *(E.)* Magee, D.F. (Creighton U. Sch. Med., Omaha, Nebr.). *Experientia* 25(10):1051, 1969.

0082 THE SECRETORY AND ACID-FORMING FUNCTION OF THE STOMACH IN PSORIASIS PATIENTS. *(Rus.)* Bogatyreva, A.V. (Novosibirsk Med. Inst., U.S.S.R.) *Vestn Dermatol Vener* 9:24-27, 1969.

See also: 0002,0012,0013,0014,0017 (P:Morph) • 0030 (P:Absorp) • 0045 (P:Motil) •

)83 PRINCIPAL ELECTROLYTES OF PANCREATIC
JUICE: RELATION BETWEEN BICARBONATES
ND CHLORIDES IN WAKING DOGS WITH CHRONIC EXPERI-
ENTAL FISTULAS. *(Fr.)* Vérine, H. (no affil) and
. Barbier. *C R Soc Biol* 163(4):866-869, 1969.

ancreatic electrolytes were measured in 2 groups
f dogs with pancreatic fistulas, which were kept
live for different periods. Mean postoperative
urvival time in group A (9 animals) and in group
(4 animals) was 6.88 and 42.25 days, resp. Com-
arison of circadian electrolyte excretion showed
reat variations in group A with respect to volume,
icarbonates, chlorides and phosphates, while the
ifferences in pH, total protein, sodium and cal-
ium were less significant. Potassium levels were
lmost identical in both groups. These changes,
ncluding the marked predominance of chlorides over
otassium and the low secretory volume, possibly
eflect postoperative stress. In group B, the re-
ation between bicarbonates and chlorides was high-
y significant, as judged by calculation of the
onfidence intervals of the mean values. Maximal
icarbonate concentrations were in the order of 100
Eq/L; increases in chlorides were associated with
ecreasing bicarbonate concentrations.

)84 RADIOIMMUNOASSAY OF PANCREOZYMIN CHO-
LECYSTOKININ IN HUMAN SERUM *(E.)* Young,
. D. (Biol. Standards Lab., Canberra, Australia)
. Lazarus and D. J. Chisholm. *J Nucl Med* 10(12):
43-745, 1969.

radioimmunoassay system for the measurement of
erum ^{131}I-labeled pancreozymin cholecystokinin is
escribed using rabbit antiserum to porcine pan-
reozymin cholecystokinin and an ion exchange resin
o separate the free labeled hormone from that
ound by the antibody. A well type gamma scintilla-
ion counter was used. There was no cross reaction
f pancreozymin cholecystokinin with secretin,
astrin, glucagon or insulin. Serum pancreozymin
holecystokinin levels were markedly increased in
dult humans after fatty and high protein meals and
00 g p.o. glucose loads.

0085 ON TRYPSIN INHIBITORS: IV: THE TWO SPECIFIC TRYPSIN INHIBITORS FROM PORCINE PANCREATIC GLANDS. *(Ger.)* Tschesche, H. (Inst. Organic Chem., U. Munich, Germany), E. Wachter, S. Kupfer and K. Niedermeier. *Hoppe Seyler Z Physiol Chem* 350(10):1247-1256, 1969.

Two chemically related trypsin inhibitors which represent together 0.1% of the total protein content of pancreatic juice were isolated in the relative proportion of 1.2:1 for inhibitor I and II. The complete amino acid sequence of inhibitor I (56 amino acid residues) and the partial sequence of inhibitor II were determined as were their isoelectric points. The two inhibitors differ in their N-terminal sequence and tryptic fingerprints.

0086 HETEROTOPIC TRANSPLANTATION OF THE PANCREAS: AN EXPERIMENTAL STUDY. *(Por.)* Pinotti, H. W. (Med. Fac. U., Sao Paulo, Brazil), G. Ellenbogen, A. Raia, W. Lins, J. Duran, E. A. Lopes, S. Fera, W. Garbin and W. Louza. *Rev Hosp Clin Fac Med S Paulo* 24(3):177-180, 1969.

0087 DIGESTIVE PROTAESES IN THE HOLOCEPHALEAN FISH *CHIMAERA MONSTROSA*. *(E.)* Nilsson, A. (Dept. Zoophysiol., U. Götenborg, Sweden) and R. Fänge. *Comp Biochem Physiol* 31(1):147-165, 1969.

0088 PHYSIOLOGY OF EXOCRINE PANCREAS: NEW FINDINGS. *(Fr.)* Terris, G. (Hosp. Laennec, Paris, France). *Gaz Med France* 76(27): 5243-5251, 1969.

0089 CANINE PANCREATIC HOMOTRANSPLANTS. *(Sp.)* Acosta, J. M. (Med. Fac. U. Natl. Rosario, Argentina), O. R. Galli, E. Weinschelbaum, J. E. Pons and E. S. Kakisu. *Prensa Med Argent* 55(19): 904-907, 1969.

See also: 0059 (P:Secr)

0090 LABORATORY INVESTIGATIONS IN EPIDEMIC HEPATITIS. *(Ger.)* Lembke, A. (Inst. Virus Res., Sielbeck Eutin, Germany), K. E. Milczewski and M. Lembke. *Zbl Bakt* 210(4):448-484, 1969.

Two serologically similar virus strains, strain 483 and strain Erika, were isolated from patients with epidemic hepatitis. Both strains had icosahedral structure and showed 162 capsomers in hexamerous-pentamerous arrangement. Morphologically, both viruses had features resembling those of herpes virus but not adenovirus. Strain 483 lost its infectivity on purification by potassium tartrate density gradient centrifugation. DNA concentrations per virus particle correspond to those of a double-stranded DNA virus. Floxuridine inhibited the synthesis of these virus strains in hog kidney cell cultures.

0091 METABOLIC ACTIVITIES OF MECHANICALLY AND ENZYMATICALLY PREPARED RAT LIVER CELLS. *(E.)* Jezyk, P. F. (Med. Coll. Virginia, Richmond) and J. P. Liberti. *Arch Biochem Biophys* 134(2):442-449, 1969.

Respiratory rates were 45% higher in isolated, intact rat liver cells prepared by the enzymatic method (EP) of Howard and Pesch than in those prepared by the mechanical method (MP) of Branster and Morton. The oxidation of ^{14}C-palmitate and ^{14}C-acetate was 62% and 650% greater in the EP-cells, resp. When the cell preparations were allowed to respire endogenously for 1 or 2 hr, the MP-cells oxidized succinate at a 32% higher rate than EP-cells during the 2nd hr of incubation. Incorporation of labeled palmitate into lipid classes was much greater in EP-cells, particularly into phospholipids (cholesterol esters (280%), triglycerides (300%), diglycerides (430%), lecithin (1475%) and phosphatidyl ethanolamine (2150%). In EP-cells incubated with ^{14}C-acetate, there was also greater incorporation of label into lipid classes. After 1-3 hr of incubation, EP-cells incorporated 20% more ^{14}C-uridine into RNA. Incorporation of ^{14}C-isoleucine into protein with MP-cells was about one-third that in EP-cells in the 3rd hr of incubation, after which protein synthesis was only nominal in the MP-cells. When livers from hypophysectomized rats were used, no decrease in total protein synthesis occurred with either cell preparation, as compared with a 43% decrease with liver slices.

0092 TUMOR LIPIDS, THE PHOSPHOLIPID COMPOSITION OF PLASMA MEMBRANES OF ZAZHDELA RAT ASCITES HEPATOMAS. *(Rus.)* Davydova, C.Y. (Inst. Exp. Clin. Oncol. Acad. Med. Sci., Moscow, USSR), V.S. Shapot, E.V. Dyatlovitskaya, T.I. Torkhovskaya and L.D. Bergel'son. *Biokhimiia* 34(5):1058-1061, 1969.

Lipid and phospholipid content of tissue and plasma membranes was studied in normal rat liver and Zazhdela ascites hepatomas by two-dimensional, thin-layer chromatography. Lipid content was similar in plasma membranes of normal liver and hepatoma, but phospholipid content was higher in the plasma membrane of hepatoma than in that of normal liver. Phospholipid content of normal liver plasma membrane was significantly different from that of normal liver homogenates. Sphingomyelin and serine- and inositolphosphatide content was markedly higher and lecithin and cardiolipid content markedly lower in plasma membranes than in homogenates. These differences in phospholipid content were much less marked or did not occur at all in plasma membranes and tissue from hepatoma.

0093 STATISTICAL EVALUATION OF SERUM GLUTAMIC-OXALACETIC AND GLUTAMIC-PYRUVIC TRANSAMINASES IN VARIOUS DISEASES OF THE DIGESTIVE TRACT. *(It.)* Barisone, D. (Inst. Int. Med. U. Genoa, Italy), S. Accardo and C. Schenardi. *Arch Maragliano Pat Clin* 25(4):297-315, 1969.

Mean values and standard deviations of SGOT and SGPT were determined in 458 patients with a variety of inflammatory and neoplastic diseases of liver, gall bladder, pancreas and intestines. Serum transaminases were above normal in acute hepatitis, hepatocholangitis, hepatic and pancreatic tumors, cholecystitis, gall bladder tumors, chronic pancreatitis and hepatitis and liver cirrhosis; highest values were present in acute hepatitis, hepatocholangitis and chronic pancreatitis. The lower limit of the 95% confidence interval on the mean values of SGOT and SGPT in acute hepatitis was higher than the upper limit of the 95% confidence interval on the mean in chronic hepatitis and liver cirrhosis, and these differences were significant. With respect to SGPT, the difference between the means in acute hepatitis and hepatocholangitis were not significant. However, the lower limit of the 95% confidence interval on the mean of SGOT and SGPT in acute hepatitis was higher than the upper limits of the 95% confidence intervals on the mean in all other forms of diseases [hepatic and pancreatic tumors, cholecystitis and gall bladder tumors and chronic pancreatitis] and thus these differences were significant.

0094 STERO-BILE ACIDS AND BILE ALCOHOLS CV. CONVERSION OF 7α, 12α-DIHYDROXYCHOLEST-4-EN-3-ONE TO 5α-CYPRINOL BY CARP LIVER. *(E.)* Hoshita, T. (Hiroshima U. Sch. Med., Japan). *J Biochem* 66(3):313-319, 1969.

The formation of 5α-cyprinol from 7α, 12α-dihydroxycholest-4-en-3-one was studied in microsomal and mitochondrial fractions of carp liver. There was a successive conversion of 7α, 12α-dihydroxycholest-4-en-3-one to 5α-cholestane-3α, 7α, 12α-triol to deoxy-5α-cyprinol to 5α-cyprinol. The transformation of 7α, 12α-triol was catalyzed by the microsomal fraction but not by either the supernatant obtained by high speed centrifugation or the mitochondrial fraction. The microsomal enzyme was

ıactive in the presence of NADH and required NADPH
; a hydrogen donor. In the microsomal system, 5α-
ıd 5β-cholestane-3α, 7α, 12α-triols were converted
) deoxy-5α-cyprinol and 5β-cholestane-3α, 7α, 12α,
)-tetrol resp. NADPH was required as a cofactor
r the hydroxylase. Neither the supernatant ob-
ıined by high speed centrifugation nor the mito-
ıondrial fraction catalyzed the hydroxylations.
ıly the mitochondrial fraction fortified with
ıDPH catalyzed the conversion of deoxy-5α-cyprinol
) 5α-cyprinol.

)95 DISC ELECTROPHORESIS IMMUNODIFFUSION
OF SERUM PROTEINS IN NORMAL HUMAN GALL-
ADDER BILE. *(E.)* Wales, E. E. (U. Utah Med.
r., Salt Lake City), E. Englert, R. T. Winward,
G. Maxwell and L. E. Stevens. *Exp Biol Med*
2(1):146-149, 1969.

sc electrophoresis-immunodiffusion studies of 10
rmal bile samples revealed the presence of 17
rum proteins. 7/17 proteins (albumin, α_1-acid
ycoprotein, α_1-antitrypsin, Gc-globulins, hapto-
obin, IgA-immunoglobulin and IgG-immunoglobulin)
re common to all 10 bile samples. Analytical
sc electrophoresis of the normal bile samples
ve a mean of 12 bands staining with amido-Schwartz
th a range of 8-20. However, no uniform disc
ectrophoresis pattern could be established although
lative relations of major bands usually were
cognizable.

)96 TEMPLATE ACTIVITY OF CHROMATINS ISOLATED FROM REGENERATING RAT LIVER. *(E.)*
ınnai, S. (Dept. Biophys. Biochem., U. Tokyo,
ıpan) and H. Terayama. *J Biochem* 66(3):289-295,
)69.

ıe priming (template) activities for RNA syn-
ıesis in normal and regenerating (12 hr after
ırtial hepatectomy) liver chromatins in male Wistar
ıts were investigated using *Escherichia coli* RNA
)lymerase and isolated chromatins. A 20% higher
emplate activity was observed in regenerating
iver chromatin but no detectable difference in
ıe ratio of histone to DNA compared to that of
ormal liver chromatin. The template activities
f normal and regenerating liver chromatins were
ompared after removal of different amounts of
istone with citric acid-1 M NaCl. The difference
ı the template activities of normal and regener-
ting liver chromatins were still apparent up to
stage of selective removal of lysine-rich his-
ones, but disappeared when most of the histones
ere removed. Removal of histones with 0.2 N HCl
esulted in a change in the template activity and
elting profiles of chromatins not found with 0.2%
itric acid-1 M NaCl. The addition of histones
fter their removal from chromatins inhibited tem-
late activity slightly in contrast to the dramatic
ncrease in template activity seen on removal of
istones from chromatins.

)97 CONTROL OF DEGRADATION AND SYNTHESIS OF INDUCED TYROSINE AMINOTRANSFERASE STUDIED IN HEPATOMA CELLS IN CULTURE. *(E.)* Auricchio, F. (Nat. Inst. Arth. Metab. Dis., Bethesda, Md.), D. Martin and G. Tomkins. *Nature*224(5221):306-308, 1969.

The degradation and synthesis of tyrosine aminotransferase (TAT), induced by adrenal steroids in hepatoma cell cultures, was studied under various conditions. The effect of the composition of the medium on the degradation of TAT was determined by following the loss of induced TAT activity when the inducer (2 x 10^{-5} M cortisol) was removed. TAT degradation in inducer-free growth medium (with serum) rose for 2 hr, then declined with a half-time of about 6 hr. After transfer to a medium lacking serum, the half-time dropped to 3 hr; following further step-down to saline, the half-time was 1.5 hr for 4 hr. The enhanced degradation was also demonstrated by radioimmunoprecipitation. Both actinomycin D, (5 μg/ml), and, to a greater extent, cycloheximide, (10^{-4} M), slowed the enhanced degradation towards the normal rate, measured either by enzymatic activity or by radioimmunoprecipitation. Enhanced degradation was quite specific for TAT, for step-down did not affect the degradation of general cell protein or RNA. It is not known whether enhanced degradation results from stimulation of the normal process or whether it is mediated by an entirely independent mechanism, such as an inducible enzyme system, the synthesis of which is stimulated by nutritional step-down.

0098 DEFICIENCY OF HEPATIC ORGANIC ANION-BINDING PROTEIN AS A POSSIBLE CAUSE OF NON-HEMOLYTIC UNCONJUGATED HYPERBILIRUBINEMIA IN THE NEWBORN. *(E.)* Levi, A. J. (Albert Einstein Coll. Med., New York, N. Y.), Z. Gatmaitan and I. M. Arias. *Lancet* II(7612):139-140, 1969.

The theory was proposed that non-hemolytic unconjugated hyperbilirubinemia in human neonates results from defective hepatic uptake of bilirubin due to deficiency of an intracellular organic anion-binding protein. The development of two hepatic cytoplasmic organic anion acceptor proteins, Y and Z, was investigated in Hartley guinea pigs ranging in age from early fetus to adult. Livers were homogenized at pH 7.4 and centrifuged at 100,000 g for 2 hr. The supernate was mixed with BSP and chromatographed on a Sephadex G-75 column (pH 7.4) at 4°C. The BSP bound by Y and Z fractions was calculated by triangulation and used as the measure of Y and Z protein. Z was low in the early fetus (mean body weight 28 g), increased before birth (mean body weight 72 g) and did not greatly change thereafter. In contrast, Y was low in the fetus, increased slowly in the neonate, and reached 75% of adult levels in animals weighing 225-285 g. Relative deficiency of Y may impair the transfer of organic anions from plasma into liver cells.

0099 FAILURE OF BILE ACIDS TO CONTROL HEPATIC CHOLESTEROGENESIS: EVIDENCE FOR ENDOGENOUS CHOLESTEROL FEEDBACK. *(E.)* Weis, H. J. (U.

Texas S. W. Med. Sch., Dallas) and J. M. Dietschy. *J Clin Invest* 48(12):2398-2408, 1969.

The role of the enterohepatic and enterolymphatic circulation of bile acids in the control of hepatic cholesterogenesis from acetate was studied in female Sprague-Dawley rats. Both biliary diversion and obstruction increased the rate of sterol synthesis by the liver 2.5- to 3-fold. After biliary diversion, the bile acid content in the liver decreased whereas after biliary obstruction, it markedly increased. There was no relation between the tissue content of bile acid and the rate of hepatic cholesterol synthesis. Restoration of the enterohepatic circulation of bile acid in rats with biliary diversion did not prevent the increase in cholesterol synthesis which occurs after diversion. Like biliary diversion, diversion of the intestinal lymphatic circulation increased the hepatic synthesis of cholesterol and the activity of β-hydroxy-β-methyl glutaryl reductase. The increase in the rate of hepatic cholesterol synthesis in rats with biliary diversion was prevented by the infusion of 7 mg of cholesterol; this is the amount of cholesterol circulating normally in the enterolymphatic circulation of the intact rat. The enterohepatic circulation of endogenous cholesterol and not that of bile acids plays a direct role in the control of hepatic cholesterol synthesis.

0100 RELATIONSHIP BETWEEN CIRCULATORY DISTURBANCE AND HISTOLOGICAL LESIONS IN THE ISOLATED RAT LIVER RESULTING FROM CARBON TETRACHLORIDE POISONING.

(E.) Nakata, K. (Osaka Med. Coll., Takatsuki, Japan) and K. Higaki. *Microvasc Res* 1(4):379-389, 1969.

Functional changes were compared with the histological lesions in the livers of male Wistar rats after injury from p.o. carbon tetrachloride. There was a marked decrease in hepatic blood flow (35% of controls at 24 hrs) as well as O_2 consumption (60% of control in 12 hrs) of the liver injured by CCl_4, following appearance of the histological lesions. The most effective factors interfering with the blood flow in the sinusoids were stenosis, resulting from marked swelling of the liver cells, and obliteration of the sinusoids by macrophage proliferation. When the hepatic blood flow was reduced severely, the liver cells in the central zones of the lobules were exposed to extremely low oxygen tensions.

0101 EFFECT OF ALCOHOL ON THE LIVER OF RATS.

(E.) Takeuchi, J. (Sch. Med., Kanazawa U., Kanazawa, Japan), A. Takada, R. Kanayama, N. Ohara and Y. Okumura. *Lab Invest* 21(5):398-405, 1969.

Factors contributing to the elevation of plasma glutamic-oxalacetic transaminase (GOT) activity and hepatic cell necrosis after a single administration of alcohol were studied in rats. Elevations of plasma GOT activity and hepatic cell necrosis after alcohol administration were not found in choline-supplemented rats and rarely in starved rats or in animals with fatty livers induced by orotic acid. In the choline-deficient rats, elevations of GOT activity and hepatic cell necrosis were more frequent in rats receiving large amounts of alcohol and in rats with severe fatty liver. However, the same changes were found in some rats receiving smaller amounts of alcohol and in some rats fed choline-deficient diets for 3 weeks than in those fed the same diet for 5 weeks. Low protein or high fat diets tended to increase the incidence of abnormally high GOT activity following alcohol administration. Simultaneous administration of choline chloride did not prevent the elevation of plasma GOT activity induced by alcohol; however, administration of α-tocopherol inhibited it. It appears that many factors contribute to the injurious effect of alcohol on the liver and these factors may enhance the action of alcohol on the liver through a common metabolic defect.

0102 IMPORTANCE OF BILE ACIDS FOR PHOSPHOLIPID SECRETION INTO HUMAN HEPATIC BILE.

(E.) Nilsson, S. (Dept. Surg., U. Goteborg, Sweden) and T. Schersten. *Gastroenterology* 57(5):525-532, 1969.

Important factors in the regulation of phospholipid secretion into bile were studied in 5 patients with normal liver function following surgery for nonobstructive gallstone disease. At the time of operation, the common bile duct was cannulated, thus permitting quantitative collection of hepatic bile during intact or interrupted enterohepatic circulation. One week after operation, enterohepatic circulation was interrupted and bile flow and secretion of bile acids, phospholipids and cholesterol were followed for 12-16 hr. A rapid decrease in the secretion of bile acids and phospholipids occurred and there was a slight decrease in bile flow and the secretion of cholesterol. Duodenal refeeding of bile acids resulted in a rapid increase in the biliary secretion of bile acids as well as of phospholipids. Bile acids returning to the liver in the enterohepatic circulation determine the biliary secretion of phospholipids. Possible mechanisms for the response of duodenal refeeding of bile acids include: (1) Bile acids enhance the intestinal absorption of phospholipids taking part in the enterohepatic circulation; (2) The biliary secretion of phosphatides is coupled to the secretion of bile acids and cholesterol in a specific macromolecular complex or micelle formed in the liver; and (3) The synthesis of phospholipids in the biliary secretion pool of the liver depends on the recirculated bile acids.

0103 STUDY OF SERUM ANTBODIES IN THE LIVER DISEASES

(Fr.) Levy, V. G. (no affil). M. Kowalczik-Rosztejn, Ch. Salmon and J. Caroli. *Rev Med Foie* 44(5):209-220, 1969.

ests for specific and non-specific antibodies ere carried out on serum samples from 186 atients with cirrhosis or acute and chronic epatitis. Positive reactions occurred in the ollowing tests: Waaler-Rose (51/155 cases); atex fixation (10/155 cases); antiliver factor y indirect immunofluorescence (35/155 cases); ntimitochondrial factor (22/70 cases); anti-mooth muscle factor (10/70 cases); antinuclear actor (43/59 cases); Coombs test (2/51 cases); nd direct immunofluorescence 9/11 cases). Waaler-ose test was positive most often in sera from atients with chronic hepatitis and the anti-itochondrial factor test in patients with primary iliary cirrhosis.

104 EXPERIMENTAL PARTIAL HEPATECTOMY: TECHNIQUE IN TWO STAGE OPERATIONS. *(Sp.)* igueroa, M. A. (Amer. Coll. Surg., Buenos Aires, rgentina) and J. A. Yanez. *Prensa Med Argent* 6(20):925-927, 1969.

105 QUANTITATIVE LIPID ANALYSIS OF HUMAN LIVER NEEDLE BIOPSY SPECIMENS. *(E.)* eunanen, A. (U. Helsinki, Finland), T. Miettinen nd E. Nikkilä. *Acta Med Scand* 186(3):149-150, 969.

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107 POSSIBLE ROLE OF THE GLUCURONIDE CONJUGATE IN THE BIOCHEMICAL MECHANISM OF INDING OF THE CARCINOGEN N-HYDROXY-2-ACETYLAMINO-LUORENE TO RAT LIVER DEOXYRIBONUCLEIC ACID *IN IVO. (E.)* Irving, C. C. (Dept. Biochem., U. ennessee, Memphis, Tenn.), R. A. Veazey and L. T. ussell. *Chem Biol Interactions* 1(1):19-26, 1969.

108 INVOLVEMENT OF TYROSINE IN THE BINDING OF CARCINOGENIC AMINOAZO DYES TO RAT-IVER PROTEINS *IN VIVO. (E.)* Matsumoto, M. (Fac. ci. U. Tokyo, Japan). *Chem Biol Interactions* (1):73-76, 1969.

109 KINETICS OF THE UPTAKE OF BSP BY ISOLATED LIVER CELLS: III. INFLUENCE OF AMAGED CELLS *IN VITRO* ON THE UPTAKE FROM SALINE OLUTION. *(Cz.)* Skaunic, V. (Med. Fac., KU, radec Kralove, Czechoslovakia) and V. Nerad. *esk Gastroent Vyz* 23(6):249-255, 1969.

110 DRUG METABOLISM IN HYPOTHERMIA. UPTAKE, METABOLISM AND BILIARY EXCRETION OF PEN-TOBARBITAL-2-C^{14} BY THE ISOLATED, PERFUSED RAT LIVER IN HYPOTHERMIA AND EUTHERMIA. *(E.)* Kaiser, S. C. (Nat. Inst. Arthritis Metabol. Dis., Nat. Inst. Hlth., Bethesda, Md.), M. P. Kelly, E. B. Forbes and M. M. Randolph. *J Pharmacol Exp Ther* 179(1):145-152, 1969.

0111 PROTEIN METABOLISM AMONG LOBES OF THE RAT LIVER IN RELATION TO SITE OF RADIOISOTOPE INJECTION. *(E.)* LeBouton, A. V. (Ctr. Hlth. Sci., U. California, Los Angeles, Calif.) and T. E. Hoffman. *Exp Biol Med* 132(1):15-19, 1969.

0112 ROLE OF CHOLESTEROL ESTERIFYING ENZYME PRESENT IN THE SOLUBLE CELL FRACTION OF RAT LIVER *(E.)* Sugano, M. (Fac. Agric., Kyushu U., Fukuoka, Japan), K. Hori and M. Wada. *J Biochem* 66(3):335-343, 1969.

0113 ACTIVATION OF LIVER SUCCINATE DEHYDROGENASE IN RATS EXPOSED TO HYPOBARIC CONDITIONS. *(E.)* Aithal, H. N. (Indian Inst. Sci., Bangalore, India) and T. Ramasarma. *Biochem J* 115(1):77-83, 1969.

0114 THE HORMONAL REGULATION OF ENZYMES IN PRENATAL AND POSTNATAL RAT LIVER: EFFECTS OF ADENOSINE 3', 5'-(CYCLIC)-MONOPHOSPHATE. *(E.)* Greengard, O. (Harvard Med. Sch., New England Deaconess Hosp., Boston, Mass.). *Biochem J* 115(1): 19-24, 1969.

0115 THE VALUE OF WASHING OUT THE ENTERIC VASCULAR NETWORK DURING EXPERIMENTAL ORTHOTOPIC LIVER TRANSPLANT. *(Gr.)* Blatzas, G. (no affil). P. Andreadis, S. Michalopoulos, E. Arealis and A. Marselos. *Hellenike Iatrike* 80(380):903-908, 1969.

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0117 EFFECT OF RIBONUCLEASE ON RAT LIVER PARENCHYMAL CELLS. *(E.)* Kumar, B. V. (Region. Res. Lab., Hyderabad, India) and P. M. Bhargava. *Life Sci* 8(20):1103-1109, 1969.

0118 TECHNICAL NOTES: A SURGICAL EXTERNAL BILIARY FISTULA FOR THE TOTAL COLLECTION OF BILE FROM RABBITS. *(E.)* Boegli, R. B. (Chem. Life Sci. Lab., Res. Triangle Inst., Res. Triangle Park, N. C.) and I. H. Hall. *Lab Anim Care*19(5):657-658, 1969.

0119 EFFECTS OF POST-HEPATECTOMIZED RAT SERA ON CULTURED CELLS. *(E.)* Gentile, J. M.

(Roswell Park Mem. Inst., Buffalo, N. Y.), E. Ali and J. T. Grace. *J Surg Oncology* 1(1):3-11, 1969.

0120 THE LOCALIZATION OF GLUCOSE-6-PHOSPHATE HYDROLYZING ENZYME IN HEPATOCYTES, RED BLOOD CELLS AND LEUKOCYTES IN THE LIVER OF THE NEWBORN RAT. *(E.)* Rosen, S. I. (Cleft Palate Res. Ctr., U. Pittsburgh, Pa.). *J Anat* 105(3):579-584, 1969.

0121 β-HYDROXYBUTYRATE DEHYDROGENASE: LACK IN RUMINANT LIVER. *(E.)* Nielsen, N. C. (Dept. Molecular Biol., Vanderbilt U., Nashville, Tenn.) and S. Fleischer. *Science* 196(3908):1017-1019, 1969.

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0124 DIFFERENTIAL STABILITY OF 28S AND 18S RAT LIVER RIBOSOMAL RIBONUCLEIC ACIDS. *(E.)* Venkov, P. V. (Biochem. Res. Lab., Bulgarian Acad. Sci., Sofia, Bulgaria) and A. A. Hadjiolov. *Biochem J* 115(1):91-94, 1969.

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0127 STUDIES OF DIETARY EFFECTS ON FREE AND MEMBRANE BOUND POLYSOMES IN RAT LIVER. *(E.)* Gaetani, S. (Nat. Inst. Nutr. U. City, Rome, Italy), D. Massotti and M. A. Spandoni. *J Nutr* 99(3):307-314, 1969.

0128 SIGNIFICANCE OF ADIPOSE TISSUE AND LIVER AS SITES OF FATTY ACID SYNTHESIS IN THE PIG AND THE EFFICIENCY OF UTILIZATION OF VARIOUS SUBSTRATES FOR LIPOGENESIS. *(E.)* 'Hea, E. K. (Dept. Anim. Sci., Univ. Ill., Urbana-Champaign, Ill.) and G. A. Veveille. *J Nutr* 99(3):338-344, 1969.

0129 STUDIES ON RAT-LIVER PHOSPHATASES. I. EFFECTS OF ACETOACETATE. *(E.)* Reddi, T. G. (Nagpur Univ., Nagpur, India), I. Bhai, B. Sivakumar, N. Nath and M. C. Nath. *Enzymologia* 37(4):227-239, 1969.

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0131 PURIFICATION AND PROPERTIES OF TWO TYPES OF DIPHOSPOPYRIDINE NUCLETIDE-LINKED GLYCEROL 3-PHOSPHATE DEHYDROGENASES FROM CHICKEN BREAST MUSCLE AND CHICKEN LIVER. *(E.)* White, H. B., (Grad. Dept. Biochem., Brandeis U., Waltham, Mass.) and N. O. Kaplan. *J Biol Chem* 244(21):6031-6039, 1969.

0132 INTERACTION OF COENZYME WITH DIFFERENTLY PREPARED ZINC-FREE (APO) HORSE LIVER ALCOHOL DEHYDROGENASES. *(E.)* Hoagstrom, C. W. (Biochem. Dept., Purdue U., Lafayette, Ind.), I. Iweibo and H. Weiner. *J Biol Chem* 244(21):5967-5971, 1969.

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0134 CHANGES IN PROTEIN SYNTHESIS IN RAT LIVER DURING THE ADMINISTRATION OF THE THIAMINE DEFICIENT DIET. *(E.)* Nagakawa, H. (Sch. Educ., Toyama U., Japan). *Kurume Med J* 16(2):101-112, 1969.

0135 ETHIDIUM BROMIDE AND CHLOROQUININE INHIBITION OF RAT LIVER CELL-FREE AMINO-ACETYLATION. *(E.)* Landez, J. H. (USAF Sch. Aerospace Med., Texas), R. Roskoski and G. L. Coppoc. *Biochim Biophys Acta* 195(1):276-279, 1969.

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0138 THE EFFECT OF RIFAMYCIN ON RNA IN THE RAT LIVER MITOCHONDRIA. *(E.)* Schmerling, Zh. G. (I. V. Kurchatov Inst. Atomic Energy, Moscow, USSR). *Biochem Biophys Res Commun* 37(6):965-969, 1969.

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0141 INITIAL EFFECT OF CARBON TETRACHLORIDE ON ASCORBIC ACID CONCENTRATION IN THE LIVER AND THE ASCORBIC ACID ELIMINATION IN THE URINE OF RATS. *(Ger.)* Hesse, V. (Inst. Pharmacol. Toxicol., Freidrich-Schiller-U., Jena, Germany) and W. Klinger. *Arch Toxikol* 25(34):306-317, 1969.

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0143 BIOCHEMICAL QUESTIONS RELATING TO INFUSION-CHOLECYSTANGIOGRAPHY. *(Ger.)* Zinner, G. (63 Untere Weissgerberstrasse, Vienna, Austria). *Radol Austria* 18(2):107-109, 1969.

0144 STUDY OF AMYLASE CONCENTRATIONS IN BILE COLLECTED SURGICALLY FROM 118 PATIENTS. *(Fr.)* Salembier, Y. (no affil), A. Gérard, P. Theillier and J. Paris. *Lille Med* 14(8):896-898, 1969.

0145 COMPARATIVE EVALUATION OF METHODS OF DETERMINATION OF THE HEPATIC PORTAL CIRCULATION: (1) EXPERIMENTAL AND CLINICAL STUDIES UNDER NORMAL CONDITIONS. *(It.)* Mattioli, F. (Inst. Clin. Surg. Ther., Genoa, Italy), G. Becchi, F. Bresadola, G. C. Torre and P. Cavaliere. *Chir Pat Sper* 16(5):445-467, 1969.

0146 ADMINISTRATION OF A DIET CONTAINING AFLATOXIN AND THE OCCURRENCE OF HEPATOMA IN RAINBOW TROUT. *(It.)* Ghittino, P. (Exp. Zooprophyl. Inst. Piedmont Liguria, Turin, Italy), M. L. Codegone, and A. Provana. *Cancro* 21(6):619-627, 1969.

0147 MODIFICATION OF HEPATIC REGENERATION WITH PARTIAL HEPATECTOMY IN MICE INOCULATED WITH EHRLICH'S CARCINOMA ASCITES AND WITH MASTOCYTOMA ASCITES. *(It.)* Bartolini Saint Omer, F. (Inst. Anat. Path. Histol., U. Florence, Italy), P. Tosi, M. Colafrahceschi and G. Bruscagli. *Arch De Vecchi Anat Pat* 53(1):165-190, 1968.

0148 PARTICIPATION OF SPLENIC AND HEPATIC LYSOSOMES IN THE STORAGE OF ANTIGEN AND IN ANTIBODY FORMATION. *(Rus.)* Uchitel, I. Ya. (Moscow, USSR) and E. L. Khasman. *Vestn Akad Med Nauk SSSR* 24(10):28-35, 1969.

0149 ROLE OF MITOSIS, ENDOMITOSIS AND AMITOSIS IN DIVISIONS OF THE LIVER PARENCHYMAL CELLS: THE ORIGINATION AND CYTOKINESIS OF BINUCLEATED CELLS AND THEIR ROLE IN PHYSIOLOGIC AND PATHOLOGIC REGENERATION OF MOUSE LIVER. *(Pol.)* Biedź-Bielawski, D. (Acad. Med. Gdansk, Poland). *Acta Biol Med* (12:59-91, 1967.

0150 EFFECT OF OXYTERRACINE ON LIVER PARENCHYMA IN MALE AND FEMALE RATS. *(Pol.)* Bielawski, W. (Acad. Med. G., Katowice, Poland) and T. Michalik. *Pol Arch Med Wewnet* 43(8):1099-1106, 1969.

0151 EFFECT OF VAGOTOMY ON THE SECRETORY FUNCTION OF THE LIVER. *(Pol.)* Uszyński, H. (Med. Acad. Warsaw, Poland). *Pol Przegl Chir* 41(10):1377-1382, 1969.

0152 EFFECT OF HYPOPHYSECTOMY ON CHEMICAL HEPATOCARCINOGENESIS IN THE RAT. *(Fr.)* Lacassagne, A. (Inst. Radium, Paris, France), A. Chamorro, L. Hurst and N. B. Giao. *C R Acad Sci* 269(11):1043-1046, 1969.

0153 PHOSPHORYLATION OF HISTONES FROM LIVER AND HEPATOMA ASCITES CELLS. *(Rus.)* Eltzina, N. V. (Inst. Exper. Clin. Oncol., Acad. Med. Sci. USSR, Moscow) and N. A. Veresotskaya. *Biokhimia* 34(5):921-924, 1969.

0154 THE QUANTITATIVE IMPORTANCE OF MITOSES FOR COMPENSATORY GROWTH OF THE LIVER AND OF THE ADRENAL CORTEX. *(Ger.)* Günther, G. (Pathol. Inst. U. Frankfort am Main, Germany), K. Hübner and E. Schneider. *Beitr Path Anat* 139(3):261-274, 1969.

0155 STUDIES ON NUCLEAR PROTEIN BIOSYNTHESIS IN RAT LIVER. *(Ger.)* Weser, U. (Chem. Physiol. Inst., U. Tübingen, Germany) and J. Koolman. *Hoppe Seyler Z Physiol Chem* 350(10):1273-1278, 1969.

0156 STUDIES ON CERULOPLASMIN METABOLISM: DYNAMICS OF COPPER AND CERULOPLASMIN IN THE LIVER. *(Jap.)* Fujii, Y. (Sch. Med. Showa U., Japan). *J Jap Soc Intern Med* 58(7):35-42, 1969.

0157 HEPATOSCLEROSIS: HYDROXYPROLINE IN SUBTOTAL HEPATECTOMY IN RATS WITH EXPERIMENTAL CIRRHOSIS (1st NOTE). *(It.)* Ronzoni, G. (Inst. Clin. Surg. Ther., Sacred Heart Catholic U., Rome, Italy), V. Pirozzi, E. Zucchetti, E. Alcini and A. W. Marin. *Chir Pat Sper* 16(5)Supp.:62-70, 1968.

0158 ACTIVITIES OF CYSTATHIONASE, CYSTEINE SULPHINIC ACID DECARBOXYLASE AND SERINE DEHYDRASE IN THE LIVER OF TUMOR-BEARING RATS. *(E.)* Chatanger, F. (Hospital Broussais, Paris, France), A. Hirsch, O. Durieu-Trautmann and M-C Rain. *Experientia* 25(10):1077-1078, 1969.

0159 ULTRASTRUCTURAL CHARACTERISTICS OF HEPATOMAS PRODUCED BY AZO DYES IN WISTAR RATS: PRESENCE OF FENESTRATED MEMBRANES (ANNULATE LAMELLAE) IN THE TRANSPLANTABLE N-13 HEPATOMA. *(Sp.)* Llomart, A. (Dept. Exp. Cancerology, U. Valencia, Spain) and A. Peydro. *Med Esp* 62(364):41-61, 1969.

See also: 0003,0008,0010,0011,0021 (P:Morph) • 0535,0539,0562,0574,0579 (D:Livbil) • 0581,0582 (D:Livbil:Nonv.Hep) • 0607,0608 (D:Livbil:V.Hep) • 0638 (D:Livbil:Cirrh)

160 GLUCOSE-6-PHOSPHATE DEHYDROGENASE ACTIVITY IN THE MUCOSA AND MUSCULATURE OF THE UODENUM AND STOMACH OF RATS WITH ALIMENTARY-ONDITIONED REFLEX. *(E.)* Balan, M. (Inst. Biol. ed. Res., Iasi Branch of S.R.R. Acad., Romania), Zerner, J. Aratei and L. Ababei. *Experientia* (10):1033, 1969.

food stereotype was induced in 18 Sprague-awley male rats by feeding them for 6 months at e same time (8:00 a.m.) for 60 min. Six imals each were sacrificed 15 min before their eding time (7:45 a.m.), during alimentation :15 a.m.), or 4 hr after being fed (1:00 p.m.). elve control rats fed a normal diet were also lled at each time. Samples of the gastric and odenal mucosa were homogenized with 0.25 M crose solution and centrifuged; the glucose-phosphate dehydrogenase (G-6-PDH) activity of e supernate was optically tested at 340 nm. -6-PDH activity (μM/g/min) in the duodenal ucosa of the controls and of those rats fed at 45 a.m., 8:15 a.m., and 1:00 p.m. was 2.12+0.82, 10+0.17, 2.64+0.70, and 0.80+0.14, resp.; the tivity in the duodenal musculature for the same oups were 0.96+0.21, 1.21+0.17, 1.45+0.50, and 77+0.28, resp. G-6-PDH activity of the stomach ucosa of the controls and of those rats killed at 45 a.m., 8:15 a.m. and 1:00 p.m. was 1.83+0.59, 98+0.28, 3.53+0.35, and 2.05+0.70, resp. The zyme activity in the stomach musculature for the me groups was 1.79+0.50, 2.95+0.13, 3.15+0.14, d 1.90+0.60, resp. In the control animals, no gnificant changes were found with respect to the which they were killed. The significant crease in enzyme activity before feeding in the ts with alimentary-conditioned reflex may be duced by nervous pathways.

61 DISACCHARIDASE ACTIVITY IN THE JEJUNAL MUCOSA OF THE AGED. *(It.)* Madzarovová-hejlová, J. (Dept. Gerontol., U. Pavia, Italy). *nerva Med* 60(77):3631-3636, 1969.

saccharidase activity was studied in jejunal cosal biopsies from 20 geriatric patients with gestive tract disorders, 60 patients (below age) with intestinal disorders, and 20 healthy ntrols. Biopsies were taken from below the odenojejunal ligament of Treitz to eliminate the fect of disaccharidase gradients in the different testinal portions. The enzymes studied were ctase, cellobiase, trehalase, saccharidase and ltase. Lactase deficiency was found in 11/20 5%) geriatric patients and in 13/60 (21.6%) pat-nts below age 65. The lactase pattern in the ntrol group was similar, with higher lactase tivity in the young and lower values in the older tients. The remaining enzyme activities were rmal in all patients. Lactase insufficiency emingly develops with age and may be due to de-etion of the enzymatic system or to poor dietary bits.

62 PROTEIN SYNTHESIS IN SMALL INTESTINE: LOCALIZATION AND CORRELATION WITH DNA SYNTHESIS AND SUCRASE ACTIVITY. *(E.)* Das, B.C. (Stanford U. Sch. Med., Palo Alto,Calif.) and G.M. Gray. *Biochim Biophys Acta* 195(1):255-257, 1969.

Protein and DNA synthesis and disaccharidase activity were compared in the small intestine of male Sprague-Dawley rats after i.p. administration of 20 μC of L-(^{14}C)-leucine and 25 μC of (^{3}H)-thymidine. (^{3}H)-Thymidine incorporation into DNA was maximal at the base of the mucosal crypts of the jejunum and abruptly decreased in upper crypt and villus locations. (^{14}C)-Leucine uptake into protein occurred not only in crypt cells but persisted at high levels in the upper crypt and lower villus. Sucrase activity was absent in the crypts but markedly increased from lower to mid-villus in the same cells that synthesized protein rapidly. ^{14}C uptake into protein in both villi and crypts occurred maximally after 3-6 hr. As cells move up the upper crypt, DNA synthesis declines precipitously to 10% of the maximum, but protein continues to be manufactured at maximal rates as the cells are beginning to differentiate.

0163 DEVELOPMENT OF IgM MEMORY IN RATS AFTER ANTIGENIC STIMULATION OF PEYER'S PATCHES. *(E.)* Cooper, G.N. (Sch. Microbiol., U. Melbourne, Parkville, Victoria, Australia), and K. Turner. *J Reticuloendothel Soc* 6(5-6):419-434, 1969.

Development of IgM memory in the spleen of rats after i.v., intra-Peyer's patch or intrafoot pad injection of a small dose of sheep red cells was studied by determining the number of plaque-forming cells which develop in that organ subsequent to a second large dose of the antigen given i.v. The memory response of rats primed by the intrafoot pad route was minimal irrespective of the time interval between the two injections. In contrast, animals injected by the former two routes exhibited significant IgM memory which developed soon after the priming injection. In Peyer's patch injection, IgM memory responses in the spleen developed in two distinct phases. The first was detectable within 6 hours of the priming injection, reached a maximum at 48 hr and disappeared within 7 days. The second occurred about 2 weeks after the initial stimulus and was detected at least 4 weeks later. At least two different types of memory cells may arise after antigen injection; experiments involving excision of the injected Peyer's patch have substantiated that this tissue acts as the source of the early IgM memory cells which may be detected in the spleen.

0164 INFLUENCE OF VAGOTOMY ON SUPERIOR MESENTERIC ARTERY BLOOD FLOW. *(E.)* Tibbin, S. (Dept. Surg., State U., N.Y., Buffalo), G.P. Burns, P.B. Hahnloser and W.B. Schenk. *Surg Gynec Obstet* 129(6):1231-1234, 1969.

The influence of vagotomy on superior mesenteric artery blood flow in mongrel dogs was studied with the use of an electromagnetic flow probe. The immediate effect of vagotomy by a wire sling in 13 anesthetized and 9 conscious dogs produced a transient decrease in flow which returned to the control values (11.0±1.8 ml/min/kg) in 30 min. In the conscious dogs, the increased post-prandial blood flow was reduced only transiently by vagotomy and then continued to increase to 63% above fasting levels at 30 min. Feeding the dogs several days after vagotomy produced an increase in flow similar to that previously observed in dogs with intact vagi. Vagal innervation probably has little influence on the mesenteric circulation.

0165 AUTOLOGOUS AND HOMOLOGOUS GRAFT OF THE SMALL INTESTINE AND RESULTS (EXPERIMENTAL STUDY). *(It.)* Castigioni, G.C. (Inst. Gen'l Surg. Clin. Surg. Therap., Sacred Heart Catholic U., Rome, Italy), G. Tamborini, L. Lojacono, F. Zucchetti, A. Butti, A. Maisano, P. Breccia, A. Conti, and A. Bellavia. *Chir Pat Sper* 16(5):401-404, 1968.

0166 INTESTINAL ABSORPTION. *(Sp.)* Landa, L. (Natl. Med. Ctr., Mexico), A.G. Angulo, M. Guerrero and J. Aguirre. *Rev Med* 5(1):39-57, 1969.

0167 CHARACTERIZATION OF ALKALINE PHOSPHATASE FROM PREGNANT RATS, PSUEDOPROGNANT DECIDUAE, FETAL PLACENTAE, ANESTRUS UTERI AND SMALL INTESTINE. *(E.)* Manning, J.P. (Warner-Lambert Res. Inst., Morris Plains, N.J.), S. Green, N.R. Inglis, and W.H. Fishman. *Enzymologia* 37(4):262-272, 1969.

0168 EXTRACORPOREAL PERFUSION OF THE ISOLATED SMALL INTESTINE: BEHAVIOR OF pH, THE PARTIAL PRESSURES OF O_2 AND CO_2, GLUCOSE, AND THE PRINCIPAL ELECTROLYTES IN THE PERFUSION LIQUID. (EXPERIMENTAL STUDY). *(It.)* Zucchetti, F. (Inst. Gen'l Surg. Clin. Surg. Therap., Sacred Heart Catholic U., Rome, Italy), L. Lojacono, G. Tamborini, A. Butti, P. Breccia, A. Fianchini, A. Maisano, A. Conti and A. Bellavia. *Chir Pat Sper* 16(6):536-546, 1968.

0169 THE INFLUENCE OF ACTH AND CORTISONE ON THE BEHAVIOR OF SOME OF THE ENZYMES IN THE EPITHELIUM AND GLANDS OF THE JEJUNUM AND COLON IN THE WHITE RAT. *(Pol.)* Kilkowska, K. *(Med. Acad. Gdansk, Poland)* and K. Koslowska. *Fulia Morph* 28(3):371-387

0170 ELECTROPHORETIC STUDY OF POLYACRYLAMIDE GEL OF THE COLON SECRETIONS OF THE RABBIT: SEARCH FOR A LYSOGENIC FACTOR. *(Fr.)* Bonnafous, R. (Inst. Physiol. Haute-Gerrone, France) and P. Reynaud. *C R Acad Sci* 269(11):1004-1006, 1969

0171 INHIBITION OF PYROPHOSPHATASE ACTIVITY OF MOUSE DUODENAL ALKALINE PHOSPHATASE BY MAGNESIUM IONS. *(E.)* Nayudu, P.R.V. (Dept. Zool., Monash U., Victoria, Australia) and P.L. Miles. *Biochem J* 115(1):29-35, 1969.

See also: 0004,0009,0020 (P.Morph) • 0028,0029,0031,0032,0033,0037 (P.Absorp) • 0038,0039,0040,0041 (P.Motil) • 0087 (P:Secr:Panc) • 0274 (D:Stomduo) • 0356 (D:S.Intest) • 0402,0403,0404,0409 (D:S.Intest:Malabs)

72 LIVER PALPABILITY IN NORMAL INFANTS AND
CHILDREN. *(E.)* Bai, K. I. (S. V. Med.
ll., Tirupati, India). *Indian Pract* 22(7):385-
7, 1969.

73 COMPARATIVE EVALUATION OF DIFFERENT
METHODS FOR THE DETERMINATION OF HEPATIC
OOD FLOW. *(It.)* Mattioli, F. (Inst. Gen. Clin.
d., U. Genoa, Italy), G. Becchi, F. Bresadola,
C. Torre and P. Cavalieri. *Chir Pat Sper* 16(6):
7-642, 1968.

74 HEMODYNAMIC CONSIDERATIONS OF THE SMALL
INTESTINE. *(It.)* Tamborini, G. (Inst.
n. Surg. Therap., Sacred Heart Catholic U., Rome,
aly), L. Lojacono, A. Butti, A. Maisano, F.
cchetti, P. Breccia, A. Conti and A. Bellavia.
ir Pat Sper 16(6):525-535, 1968.

75 ON THE HORMONE CONTROL OF MOTOR ACTIVITY
OF THE DIGESTIVE TRACT. *(Rus.)* Fokina, A. A. (Pavlov Inst. Physiol., Leningrad, USSR). *Biull Exp Biol Med* 68(10):19-22, 1969.

0176 FIRST FINDING OF A RODENT (*NECTOMYS SQUAMIPES)* NATURALLY INFECTED BY *SCHISTOSOMA MANSONI* IN THE STATE OF SAO PAULO, BRAZIL. *(Por.)* Rodrigues, D. C. (Med. Fac. U., Sao Paulo, Brazil) and C. S. Ferriera. *Rev Inst Med Trop S Paulo* 11(5):306-308, 1969.

0177 THE LYMPHATIC VESSELS. *(Fr.)* Servelle, M. (no affil) and I. Zafari. *Vie Med* 50(1): 3697-3710, 1969.

0178 SOME INDICES OF THE DIGESTIVE FUNCTION IN HEALTHY CHILDREN. *(Rus.)* Kuzmenko, V. V. (Sci. Res. Inst. Child. Infect., Leningrad, USSR) and H. V. Shaidulina. *Vop Okhr Materin Dets* 14(9): 3-7, 1969.

DIAGNOSTIC PROCEDURES

0179 CONTRIBUTION TO THE DIAGNOSIS OF MALIGNANT TUMORS. *(Ger.)* Probst, H. (Inst. Physiol. Chem. U. Tübingen, Germany), J. Durst, W. Heller, S. Spieler and D. Völter. *Med Welt* 87(44):2406-2407, 1969.

Serum haptoglobin, iron, and copper were useful parameters in distinguishing between inflammatory diseases and malignant tumors in 50 patients. Intestinal and bronchial neoplasms were associated with increases in haptoglobin and copper levels and a decrease in serum iron. The reduction in the latter was not observed with inflammatory processes.

0180 PROBLEMS OF INFUSION CHOLECYSTOCHOLANGIOGRAPHY. *(Ger.)* Meyer-Burg, J. (Munic. Hosp., Berlin-Spandau, Germany). *Deutsch Med Wschr* 94(40):2018-2023, 1969.

Infusion cholecytocholangiography in 30 patients was associated with improved visualization of the bile ducts in 19 patients, in whom roentgenography had previously not provided sufficient diagnostic clues. This improvement was apparently due to the optimal supply of contrast medium to the liver. Administration of ioglycamide (Bilivistan), 40 ml, over a period of 15 min, was not associated with increased renal excretion. The agent was well tolerated but produced significant increases in glutamic oxalacetic and pyruvic transaminases. The infusion method is contraindicated in patients with severe liver damage.

0181 VALUE OF THE SUBMAXIMAL BETAZOLE TEST IN ASSESSING INDICATIONS FOR RESECTION-LESS FORMS OF OPERATIVE INTERVENTION WITH GASTRIC AND DUODENAL ULCER. *(Ger.)* Rehner, M. (Marienkrankenhaus, Hamburg, Germany) and W. Koch. *Deutsch Med Wschr* 94(44):2278-2280, 1969.

The suitability of the submaximal betazole test as a standard method of investigation was studied in 44 male ulcer patients. Preoperative stimulation with betazole, 50 mg, on 3 separate days,resulted in similar acid levels after 60 and 120 min, and comparable volumes of secretion and peak acid concentrations. The reproducibility of the test was confirmed by statistical analysis as was the absence of patient or investigator influence on the test results.

0182 DIAGNOSTIC SIGNIFICANCE OF AMINO ACID ARYLAMIDASE (ALANINE AMINOPEPTIDASE) AND ITS ISOENZYMES L AND 2 IN DISEASES OF THE PANCREAS AND EFFERENT BILE DUCTS. *(Ger.)* Beier, I. (Inst. Clin. Biochem., Martin Luther U., Halle, Salle, Germany), L. Beier and R.J. Haschen. *Deutsch Gesundh* 24(38):1804-1810, 1969.

Enzyme determinations in 121 serum samples from 69 patients showed that alanine aminopeptidase-1 is a more specific and sensitive indicator of extra- and intrahepatic obstruction than alkaline phosphatase. The enzyme which is increased in these conditions is associated with the microvilli of the liver cells and found in the vicinity of the bile capillaries. Alanine aminopeptidase-2 was a more reliable indicator of pancreatic diseases than amylase. The degree of its activity depended on the intensity of the disease process. It was highest in acute pancreatitis and values of descending order of magnitude were recorded in chronic intermittent and chronic continuous type of pancreatitis. The enzyme did not detect pancreatic cirrhosis and fibrosis nor parenchymatous lesions including cysts and hematomas.

0183 "LOW" VERSUS "HIGH" CONCENTRATION CHYMOTRYPSIN IN GASTRIC EXFOLIATIVE CYTOLOGY. *(E.)* Brandbourg, L.L. (Va. Hosp., San Francisco, Calif.), C.B. Tankersley and F. Uyeda. *Gastroenterology* 57(5):500-505, 1969.

Gastric exfoliative cytology was studied in 200 patients with benign and malignant stomach diseases using a low (7 mg) and high (28 mg) dose chymotrypsin lavage and Ringer's solution. The diagnostic quality of high dose chymotrypsin lavage was superior to both low dose chymotrypsin lavage and Ringer's solution. Malignant disease of the stomach (confirmed histologically) was accurately diagnosed by chymotrypsin lavage in 13/14 patients. There was only 1 false positive test with chymotrypsin lavage in 186 patients with benign disease. Chymotrypsin, 5-6 mg/100 ml in acetate buffer, pH 5.6, increases the diagnostic quality of gastric cell specimens and permits easier gastric exfoliative cytology.

0184 IMPROVED ROENTGENOLOGIC DIAGNOSIS OF THE BILLIARY DUCTS IN CHRONIC LIVER DISEASE WITH IMPAIRED HEPATIC FUNCTION. *(Ger.)* Günther, H. (Charity Clin., Humboldt U., Berlin, Germany), B. Kunz, H. David, D. Theuer, H.B. Zimmermann and D. Ilius. *Deutsch Gesundh* 24(40):1876-1881, 1969.

The diagnostic value of infusion cholecystocholangiography was studied in 66 patients with chronic liver diseases including cirrhosis with and without portal hypertension and progressive hepatitis. BSP retention, which served in classification of the patients, was 10% or greater in all instances. Serum bilirubin was increased to 9.9 mg% maximally, alkaline phosphatase was elevated to approximately 450 IU while SGOT and SGPT were within normal range. Visualization of the gall bladder and biliary ducts was possible in 73 and 77% of the patients, respectively. Tomography was required in the majority of cases. The tolerance of the contrast medium, adipiodone, was distinctly better with the infusion method. This method is recommended for all chronic patients who have no acute exacerbations and in whom BSP retention is above 10%, bilirubin is higher than 2 mg% and alkaline phosphatase is greater than 100 IU

ncreases in transminases and oliguric renal
nsufficiency are contraindications of contrast
edium infusion.

185 TELEMETRIC CAPSULE AS pH INDICATOR IN
ENDOGASTRIC ACIDITY TITRATIONS. *(Ger.)*
eyle, P. (Polyclin, U. Erlangen-Nurnberg, Germany),
.E. Miederer and O. Stadelmann. *Deutsch Med Wschr*
4(44):2274-2278, 1969.

astric secretion was studied in 29 patients by
sing the Heidelberg telemetric capsule and compared
ith Kay's augmented histamine test. Endogastric
itration gave reproducible and satisfactory results
n routine diagnosis, if there was normal acidity
r hyperchlorhydria. It was not sufficiently
eliable in the detection of hypochlorhydria.

86 SIGNIFICANCE OF THE AMMONIA TOLERANCE TEST
(ATT) IN THE DIAGNOSIS OF PORTAL HYPER-
NSION AND DETERMINATION OF THE FUNCTION OF
RTOCAVAL ANASTOMOSES. *(Ger.)* Wagner, K.
harité Clin. Humboldt U., Berlin, Germany), W.
himmelpfennig and G. Schneider. *Deutsch Gesundh*
(38):1799-1804, 1969.

monia concentration in venous blood prior to and
ter ammonium chloride, 3.0g p.o., was compared in
althy subjects and in patients with chronic hep-
itis, liver cirrhosis and surgically created
rtocaval shunt. Subjects with intact liver and
tients with chronic hepatitis tolerated ammonia
ad without any rise in peripheral ammonia levels.
tients with liver cirrhosis and portocaval shunt
hibited rises in peripheral ammonia of 120 and
%, resp., indicating that the outcome of the
monia tolerance test depends on the presence of
atofugal collateral circulation and that
thological results are primarily related to
duction in portal circulation. The diagnostic
lue of the test and its advantage over spleno-
rtography was pointed out.

7 EVALUATION OF SCREENING METHODS FOR CARCI-
NOMA OF THE LARGE BOWEL: BASED ON A
OLOGIC STUDY OF RECTAL SMEARS USING FLOURESENCE
ROSCOPY. *(E.)* Arminski, T.C. (Grace Hosp.,
roit, Mich.) and D.W. McLean. *Dis Colon Rectum*
6):399-405, 1969.

a double-blind study, smears were taken from the
tal mucosa of 1000 patients with various large
el or anorectal symptons and stained with
idine orange. Atypical cells were generally
mped in a more haphazard manner than normal ones.
y had enlarged nuclei of varied configuration,
well as enlarged distinct nucleoli and less
oplasm than normal cells. Approximately 75%
22 patients with proven adenocarcinoma of the
on or rectum had atypical cells.Fifty-five
ients had atypical cells but no evidence of
cinoma by barium enema examination or sigmo-
oscopy. Large-scale cytologic screening for
ge carcinoma is advocated.

0188 RADIOLOGICAL DETECTION OF EARLY CARCINOMA AND PRE-MALIGNANT LESIONS OF THE COLON AND RECTUM. *(E.)* Welin, S. (Malmö Allmanna Sjukhuset, Sweden). *J Roy Coll Surg Edinb* 14(5): 278-286, 1969.

Double contrast examination of the colon, using tannic acid and atropine, has proven valuable in detecting neoplasms and potentially pre-concerous polypoid lesions a few mm in diameter. Over a 14 yr period, the double contrast technique was used in 40,783 examinations revealing 3,359 polyps, a frequency of 11.8% which corresponds to that reported in autopsies. The majority of the polypoid lesions are small and benign and do not require surgery. When the double contrast technique reveals the following characteristics, surgery is indicated: (1) a constant dimpling or indentation of the colon wall at the site of the polyp, (2) irregularity of the tumor surface, (3) a diameter of more than 10 mm, (4) an increase in size during follow-up, and (5) multiple tumors. Routine double contrast examination of the large bowel is proposed.

0189 FIBEROPTIC ENDOSCOPY IN THE MANAGEMENT OF ACUTE UPPER GASTROINTESTINAL HEMORRHAGE. *(E.)* McCray, R.S. (Boston City Hosp., Mass.), S.J. Winawer, F. Martin, H.Amir-Ahmadi and N. Zamcheck. *Gastroint Endosc* 16(2):86-87, 1969.

Fiberoptic endoscopy was performed on 218 patients with acute upper gastrointestinal hemorrhage. The fiberoptic esophagoscope was introduced and, when possible, passed through the gastroesophageal junction for proximal stomach examination. An Ewald tube was passed to irrigate the stomach, then the fiberoptic gastroscope was introduced. Barium studies were performed following endoscopy. The source of hemorrhage was demonstrated by esophagoscopy in 30 patients and by gastroscopy in 149 patients. Diagnosis was accomplished by endoscopy alone in 151 patients. A duodenal or gastric ulcer not seen on endoscopy was demonstrated radiologically in 18 patients. Hemorrhagic gastritis and superficial acute gastric ulcers are common causes of hemorrhage which can be diagnosed only by endoscopy.

0190 VISUALIZATION OF STRUCTURAL DETAILS IN THE LIVER SURFACE BY ENDOSCOPY WITH MAGNIFYING OPTICS. *(Ger.)* Lent, H. *Endoscopy* 1(3): 107-114, 1969.

Intravital endoscopy of the liver surface provided additional morphological information and aided solution of diagnostic problems. Surface abnormalities observed by this method in a series of hepatic disorders are described and included congested and obliterated lymph vessels in fibrosis of the liver capsule; bark-like wrinkling of the surface in subchronic hepatitis with dense fibrosis of the capsule; congested lymph vessels in and around the falciform ligament in chronic aggressive hepatitis; markedly congested veins in the capsule and numerous budding arterial vessels in a case of cirrhosis.

0191 EVALUATION OF PORTAL CIRCULATION IN HEPATIC CIRRHOSIS: A NEW METHOD USING XENON-133.

(E.) Grace, N.D. (Lemuel Shattuck Hosp., Boston, Mass.), D.O. Castell, M.H. Wennar, T.C. Chalmers and E.W. Moore. *Gastroenterology* 57(5):533-541, 1969.

A new easy and reproducible method for estimating portal circulation by monitoring precordial radioactivity following rectal administration of xenon-133 was studied in patients with mild and severe cirrhosis and in cirrhotic patients with surgical portocaval shunts. Portal circulation time was either estimated visually from the initial tracing or calculated from a semilogarithmis plot of precordial activity against time. The slope of appearance of precordial radioactivity was also obtained by the latter method. A significant difference in both circulation time and rate of appearance of xenon-133 at the precordium was observed in cirrhotic patients with portacaval shunts and in nonshunted cirrhotics, both mild and severe. Portal circulation time was prolonged in patients with severe cirrhosis, and this was associated with a reduction in the rate of appearance of xenon-133 at the precordium. Patients with portacaval shunts showed a rapid rate of appearance at the precordium and a decreased circulation time. Patients with mild cirrhosis showed intermediate values. Data obtained in 1 patient before and after a surgical portacaval shunt and in 1 patient with documented thrombosis of a shunt suggest that xenon-133 portal circulation time may be useful in diagnosis of portacaval shunt occlusion.

0192 FIBERDUODENOSCOPE: DIRECT OBSERVATION OF THE AMPULLA OF WATER.

(E.) Oi, I. (Tokyo Women's Med. Coll. Japan), T. Takemoto and T. Kondo. *Endoscopy* 1(3):101-103, 1969.

A fiberduodenoscope, 50 cm in length and 11 mm in diameter, with a side-viewing lens which can be flexed, rotated and extended, was used to visualize the duodenum in 105 patients. It was possible to see the first segment of the duodenum in all 105 patients, the second segment in two-thirds of the patients, and the ampulla of Vater in one-half of the patients. Duodenal polyp, diverticulum and ulcer, and cancer of the ampulla of Vater were diagnosed endoscopically by the fiberduodenoscope.

0193 DIAGNOSTIC VALUE OF DETERMINATIONS OF LIPASE AND OF ELASTASE INHIBITORS IN PANCREATIC DISEASE: STUDY OF 95 PATIENTS.

(Fr.) Fabiani, P. (Hôtel-Dieu, Paris, France), C. Frossard, J. Frossard, J.P. Lenroit, M. Huguier and L. Leger. *Presse Med* 77(43):1507-1510, Oct 18, 1969.

Serum concentrations of lipase and elastase inhibitors in 24 afebrile nondiabetic controls were compared with those in 71 patients with pancreatic cancer and acute and chronic pancreatitis. The mean lipase level in a control group was 1.24 U (Cherry-Crandall units) as compared to 3.36 U in patients with acute pancreatitis. These changes were statistically significant in contrast to the insignificant variations observed in patients with chronic pancreatitis and pancreatic cancer. The serum concentration of elastase inhibitors, as judged by diluting a system of elastase-elastin with decreasing amounts of serum, was significantly higher in patients with acute pancreatitis than in the controls, in chronic pancreatitis and in pancreatic cancer. Data substantiate the diagnostic usefulness of increases in serum lipase and elastase inhibitors in acute pancreatitis and may also have a certain prognostic or differential diagnostic value in judging the severity of the disease.

0194 DIAGNOSTIC VALUE OF GAMMA GLUTAMYL TRANSPEPTIDASE IN CHILDREN AND ADOLESCENTS WITH LIVER DISEASE.

(E.) Cohen, M.I. (Montefiore Hosp. Med. Ctr., Bronx, N.Y.) and H. McNamara. *J Pediat* 75(5):838-842, 1969.

Sera of 115 patients were assayed for gamma glutamyl transpeptidase (GGTP) activity. Seventy-four were control subjects; a normal range was established for the pediatric-adolescent age group (225 µg/100ml±26). Forty-one children (22 males, 19 females; median age 11.3 yr) had either a predominantly inflammatory disease (27) of the liver or cirrhosis(14). The mean serum GGTP activity was higher in patients with liver disease than in control subjects; patients with cirrhosis had higher GGTP (2,715 ug/100 ml± 284) activity than those with inflammatory liver disease (1,251 ug/100 ml±122).

0195 DIRECT PORTOHEPATOGRAPHY: TECHNIQUE AND INDICATIONS.

(It.) DiMatteo, G. (Inst. Pathol. Surg. U. Rome, Italy), F.P. Campana, M. Barilla, G. Zambianchi and N. Picardi. *Ann Ital Chir* 44(6):877-889, 1969.

Direct portohepatography is based on restoring the patency of the umbilical vein which, although obliterated after birth, persists partially in the round ligament and is separated from the vessels of the portal system by a fibrous diaphragm. After incision through the linea alba in supra-umbilical region, the vein may be located as a whitish cord i the preperitoneal fatty tissure. Usually accompanied by 2 thin para-umbilical veins, it takes a vertical course in caudocephalad direction toward the midpoint of the xipho-umbilical line where it penetrates the parietal peritoneum of the falciform ligament. At this point, the vein suddenly increases in diameter and may be opened by a horizontal incision, and sounded up to the junction with the portal circulation after perforation of the separating diaphragm. Subsequent injection of hydrosoluble or preferably liposoluble contrast medium ensures visualization of the portal trunk and its intrahepatic ramification and of the hepat parenchyma. This method was used to diagnose and locate hepatic metastases of gastric and intestinal

ncers. The metastatic tumors were diagnosed by
terruptions and filling defects in the branches
the portal vein and the presence of large lacunae
the hepatic parenchyma. This method may be
re useful and less hazardous than splenoporto-
aphy.

96 PANCREATIC SCINTIGRAPH. *(Fr.)* Comet, M.
o affil). *Gaz Med France* 76(27):5317-5318, 1969.

Se-labeled methionine, 275 mC i.v., is selectively
xed by the pancreas and liver. Pancreatic scinti-
aphs are obtained which range in color (in
creasing activity sequence) from purple, red,
ange, green, blue, pink, black and white, with a
.5% difference in activity between each color.
ecial precautions (fasting, meals) do not improve
e quality of the image. In acute pancreatitis,
intigraphs reveal a complete absence of fixation.
pancreatic cysts, there is a complete absence of
xation. In pancreatic cysts, there is a complete
sence of fixation at the head of the pancreas but
e body and tail have total fixation. ^{75}Se-
thionine does not produce toxic effects.

97 COMPARISON OF A-SCAN AND COMPOUND B-SCAN ULTRASONOGRAPHY IN THE DIAGNOSIS OF LIVER
SEASE. *(E.)* Wells, P.N.T. (Dept. Physics Med., U.
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E.A. Read. *Brit J Radiol* 42(503):818-823, 1969.

curacies of A-scan and two-dimensional B-scan
trasonography in the diagnosis of liver disease
irrhosis, secondary neoplasm, obstructive and
n-obstructive jaundice, fatty liver) were
mpared in 76 patients. A-scan was 74% accurate
d compound B-scan 69%. Compound B-scan was
re accurate than A-scan in differentiating
tween obstructive jaundice and other types of
undice and in diagnosing carcinomatosis.
appears that A-scan and compound B-scan are
mplimentary diagnostic methods, and higher
gree of accuracy is obtained when both methods
e used simultaneously.

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0204 EARLY CANCER DIAGNOSIS IN GASTROENTEROLOGY. *(Ger.)* Müller-Wieland, K. (Med. Clin. U., Hamburg, Germany). *Med Welt* 87(47):2557-2561, 1969.

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0268 EVALUATION OF RADIOLOGICAL DIAGNOSIS OF GASTRIC CARCINOMA.

(E.) Brito, J. S. (St. Joseph Hosp., Bangor, Maine). *J Maine Med Ass* 60(11):255-261, 1969.

Routine radiological examinations provided a positive diagnosis in 79/100 (79%) patients with proven gastric carcinoma. Of 21 incorrect diagnoses, 7 (33%) involved polypoid defects. Difficulty was also encountered with lesions of the antrum (71.4% accuracy) and the fundus (78.0% accuracy). With cytological examinations, results were positive or strongly suspicious in 69/87 (79%) patients. The polypoid group again provided the most difficulty with 5 incorrect diagnoses out of 20 cases. There was greater accuracy for diffuse lesions with radiological testing (86.2%) than with cytological testing (79.3%). In 4 cases, both methods missed the correct diagnosis while in 56 cases both methods agreed on the correct diagnosis. Endoscopic examinations provided a correct diagnosis in 18/37 (50%) patients but radiological examination of these patients was only 60% accurate.

0269 ENDOSCOPICAL OBSERVATION OF THE GASTRIC ULCER.

(E.) Kawai, K. (Kyoto Prefectural U. Med., Japan), K. Murakami and F. Misaki. *Endoscopy* 1(3):97-101, 1969.

From 498 cases of gastric ulcers, the course of 195 round ulcers was followed endoscopically for 3 months. Of these, 152 were healed keeping their original round shape (α-course); 31 showed a short linear niche meeting with the lesser curvature of the stomach at right angles (β-course); 9 split into kissing ulcers (γ-course) and 3 cases of a giant ulcer of the body of the stomach showed a long linear niche parallel to the lesser curvature (δ-course). Ulcers taking the α-course were less apt to relapse and recur than those of the other courses. Linear ulcers, (found in 10% of the 498 cases of gastric ulcer) follow 3 pathogenic patterns of development. Fifteen percent of all round ulcers develop into linear ulcers.

0270 EFFECT OF ATROPINE ON HISTAMINE-AND GASTRIN-INDUCED GASTRIC SECRETION IN CHRONIC DUODENAL ULCER PATIENTS PRIOR TO AND FOLLOWING SURGICAL PYLOROPLASTY.

(Pol.) Konturek, S. (Int. Dis. Clin., Krakow, Poland), J. Oleksy and A. Wysocki. *Pol Tyg Lek* 24(44):1693-1695, 1969.

Atropine sulfate, 12.5 - 50 μg/kg, was infused i.v. for 30 min prior to the administration of pentagastrin or histamine in 20 patients with chronic duodenal ulcer with intact stomach innervation and in 12 patients after vagotomy and pyloroplasty. Atropine sulfate produced a dose-dependent decrease in basal and pentagastrin-and histamine-stimulated HCl secretion both in patients with intact stomach innervation and those after vagotomy with pyloroplasty. Greatest reduction in basal and stimulated HCl secretion occurred after the administration of 25 μg/kg of atropine sulfate.

0271 CLINICAL AND BIOLOGICAL STUDY OF THE EFFECT OF S.C.H. 34-44 IN GASTRODUODENAL PATHOLOGY.

(Fr.) Frexinos, J. (no affil), J. P. Pascal and A. Ribet. *Rev Med Toulouse* 5(8):1003-1009, 1969.

S.C.H. 34-44(Vagopax) 1.0-1.5 mg/day for 3-10 days, was administered to 30 patients with a variety of disorders including ulcers, gastritis, hiatal hernia and esophagitis. Complete improvement with respect to pain and dyspepsia occurred in 21 patients and partial improvement in 6. In 21 patients, there was a decrease in volume of secretion, HCl concentration and flow, and alkaline volume. There was complete improvement in 4/9 patients with bulbar ulcer, accompanied by a distinct reduction in acid secretion. Dryness of mouth was the only side effect of Vagopax.

0272 ALTERATIONS IN THE COURSE OF RHEUMATISM.

(Fr.) Caluser, I. T. (Inst. Med., Cluj, Romania). *Acta Belg* 32(7-8):541-551, 1969.

Histopathological studies of 309 deceased rheumatic patients revealed involvement of digestive organs in 75.1% of the male patients and 24.9% of the female patients. Alterations were not specific, were of low intensity, and were distributed zonally in the mucosa and submucosa of the stomach and small intestine. Gastric lesions were present in many of the patients. The morphological changes in these patients can be considered as reactive manifestations characteristic of the digestive tract and due more to gastroenteritis than to intolerance to drugs used in the treatment of rheumatism.

0273 EXPERIMENTAL STUDY OF THE ULCEROGENIC EFFECT OF A CORTICOSTEROID COMBINATION.

(It.) Schena, F. P. (Inst. Gen. Clin. Med., U. Bari, Italy), V. Liso and G. Troccoli. *Clin Ter* 49(6):566-575, 1969.

The acute and chronic ulcerogenic effects on the stomach of a combination of betamethasone hemisuccinate, 0.678 mg, prednisolone hemisuccinate, 1.79 mg, and 16β-methylprednisone hemisuccinate, 5.33 mg, were compared with those of the individual drugs in a series of 100 female albino rats. In the acute experiment, the animals received treatment for 7 days with a dose of the combination that was equivalent to 10 mg/day of prednisone per animal. After sacrifice on day 8, the animals receiving the combination exhibited a lower mean ulcerogenic index than the rats treated with the single components, in particular 16β-methylprednisone which had the highest ulcerogenic effect and produced the most severe lesions. In the chronic experiment, the rats were treated for 60 days with a dose of the combination that corresponded to 1 mg/day of prednisone per animal. The combinatio was not associated with ulcerogenic effects, wherea the single components and particularly betamethaso and 16β-methylprednisone had a high mean ulcerogen index, caused extensive lesions and were associated with elevated mortality. Multiple mechanisms of steroid ulcerogenesis and the lower doses of the component steroids were cited as possible causes of the less harmful effect of the combination.

0274 AUTOIMMUNITY AND CHRONIC ATROPHIC GASTRITIS. *(It.)* Serafini, U. (Inst. Med. Pathol., U. Florence, Italy), C. Masala, A. M. Pala and C. V. DePhillipis. *Folia Allerg* 16(4):342-369, 1969.

Incidence of gastric autoantibodies in a group of 1430 apparently healthy subjects was 5%, increased with age, and was higher in females. In a series of diseases, including acute and chronic infections, diabetes and intestinal ulcers and cancers, the incidence of gastric antibodies was higher than normal only in patients with hay fever and/or asthma. Distribution of gastric antibodies into the major classes of immunoglobulins was investigated in 28 patients with chronic gastritis and positive antiserum immunofluorescence reaction. Their gastric antibodies were predominantly present in IgG globulins but were also found in IgA and IgM globulins. Autoantibodies were present in gastric juice both prior to and after histamine stimulation in 45% of these 28 patients. Unlike the antibodies of serum which reacted mainly with IgG, the antibodies of gastric juice reacted more frequently with IgA indicating that their presence in gastric juice may not be due to filtration from the serum but may reflect local production. Symptoms of gastritis or hypotonic gastritis were present in 4/28 patients. However, gastric biopsy showed lesions consistent with superficial, preatrophic or atrophic gastritis in all instances. The fact that chronic atrophic gastritis may also occur in patients without circulating antibodies suggests that one form is related to immunological phenomena and the other to physico-chemical or bacterial factors. Contrary to the proven correlation between gastric and thyroid autoantibodies in pernicious anemia and Hashimoto's thyroiditis, there was no significant correlation between these autoantibodies in chronic gastritis.

0275 HISTOLOGICAL DIFFERENTIATION OF GASTRIC CARCINOMA COMPARED WITH THE STRUCTURE OF THE MUCOSA. *(E.)* Urban, A. (Dept. Path., Inst. Oncol., Cracow, Poland). *Acta Med Pol* 10(3):263-271, 1969.

The histology of the mucosa without macroscopic changes from the area beyond a tumor was compared with the level of differentiation of the carcinoma in 412 patients with surgically-treated gastric carcinoma. In a group of 111 undifferentiated gastric carcinomas, 39.6% are associated with the normal fundic mucosa as contrasted with 18.3% of 60 cases of highly differentiated carcinomas; conversely, 51.6% of highly differentiated gastric carcinomas were associated with intestinal metaplasia of the fundic mucosa, but only 33.3% of the undifferentiated tumors, indicating that the structure of the tumor and the mucosa are very closely related and are influenced by the same biological factors. Metastases and well differentiated cancers increase with age while undifferentiated lesions decline in frequency. The structure of the gastric carcinoma seemingly bears the distinct specificity of the organ in which it develops.

0276 THE SURGICAL SIGNIFICANCE OF ELEVATED SERUM AMYLASE ESPECIALLY FOLLOWING GASTRECTOMY. *(E.)* Jonas, K. C. (Doctors Hosp., Washington, D.C.). *Med Ann DC* 38(11):607-609, 650, 1969.

0277 HEMORRHAGIC EROSIVE GASTRITIS. *(E.)* Melgar, A. (1900 N. Oregon, El Paso, Texas). *Southwest Med* 50(11):199-201, 1969.

0278 INTRAMURAL HEMATOMA OF THE DUODENUM. *(E.)* Bush, A. K. (Myers Clinic, Philippi, W. Va.). *W Virginia Med J* 65(12):395-398, 1969.

0279 RARE OBSERVATION OF A NEONATAL GASTRIC NEOFORMATION OF HETEROTOPIA OF INTESTINAL MUCOSA. *(It.)* Anastasio, M. (1st. Inst. Surg. Path., U. Rome, Italy) and G. Pironti di Campagna. *Ann Ital Chir* 44(6):959-966, 1969.

0280 PRIMARY ADENOSQUAMOUS CARCINOMA OF THE STOMACH. *(E.)* Straus, R. (St. Jospeh Hosp., Burbank, Cal.), S. Heschel and D. J. Fortmann. *J Amer Cancer Soc* 24(5):985-995, 1969.

0281 REMOTE EVALUATION OF FREEZING OF GASTRIC MUCOSA IN THE TREATMENT OF ULCERS OF THE STOMACH AND DUODENUM AND OF HEMORRHAGE OF THE UPPER PART OF THE DIGESTIVE TRACT. *(Pol.)* L. Bobak and D. Karcz. *Pol Przegl Chir* 41(10):1349-1355, 1969.

0282 MUTUAL RELATIONSHIP BETWEEN THE GASTROSCOPIC PICTURE, HCl SECRETION AND THE HISTOLOGICAL CHANGES OF THE GASTRIC MUCOSA AFTER GASTRECTOMY. *(Cz.)* Beno, I. (Bratislava, Czechoslovakia), A. Dvorský, A. Bučko and J. Babala. *Cesk Gastroent Vyz* 23(6):256-261, 1969.

0283 SODIUM BALANCE IN PATIENTS WITH GASTRIC CANCER AT REST. *(Pol.)* Oszacki, J. (Inst. Oncol., Cracow, Poland), A. Marczyńska, J. Kulpa, B. Sowińska and W. Lejman. *Nowotwory* 19(3):181-188, 1969.

0284 PRIMARY LYMPHORETICULAR NEOPLASIA OF THE STOMACH: PRESENTATION OF THREE CASES. *(It.)* Nichelatti, T. (Inst. Anat. Path. Histol., U. Pavia, Italy), G. P. Strada and F. Scaltriti. *Arch de Vecchi Anat Pat* 51(2):611-632, 1969.

0285 SQUAMOUS-CELL CARCINOMA OF STOMACH WITH LIVER METASTASIS. *(E.)* Milstoc, M. (New York U. Med. Ctr., Goldwater Mem. Hosp., Welfare Island, N. Y.). *New York J Med* 69(22):2913-2914, 1969.

0286 TOTAL GASTRECTOMY WITH JEJUNAL INTERPOSITION BETWEEN ESOPHAGUS AND DUODENUM. *(It.)* Stefanini, P. (2nd Surg. Clin., U. Rome, Italy) and G. Ribotta. *Gaz Sanit* 40(6):236-242, 1969.

0287 OCCLUSIVE AND SUBOCCLUSIVE PATHOLOGY OF THE DUODENUM IN THE NEWBORN AND THE SUCKLING: CONSIDERATIONS OF 40 CASES. *(It.)* Giacomoni, M. A. (Gen. Surg. Clin., U. Milan, Italy). *Arch Ital Chir* 95(1):82-105, 1969.

0288 CARCINOMA OF GASTRIC STUMP: A CASE REPORT AND REVIEW OF THE LITERATURE. *(E.)* Michaels, M. (Albert Einstein Med. Ctr., Philadelphia, Pa.) and R. Rachman. *J Albert Einstein Med Center* 17(3):132-135, 1969.

0289 MULTIPLE GASTRIC AND DUODENAL ULCERS: STUDY OF 77 OBSERVATIONS. *(Fr.)* Lagache, G. (Central Hosp., Lille, France), B. Combemale and M. Vankemmel. *Acta Chir Belg* 68(4):262-275, 1969.

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0291 GASTROSCOPIC FINDINGS IN KAPOSI'S SARCOMA. *(E.)* Rajan, R. K. (Norwalk Hosp., Norwalk, Conn.), S. Goodman and M. H. Floch. *Gastroint Endosc* 16(2):104-106, 1969.

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0294 CONGENITAL STENOSIS OF THE FIRST PART OF THE DUODENUM IN AN ADOLESCENT. *(E.)* Lubbins, E. J. (U. Hosp., Nijmegen, Holland) and W. P. Rijnders. *Gastroenterology* 57(5):574-578, 1969.

0295 GASTRIC PHYCOMYCOSIS. *(E.)* Deal, W. B. (U. Florida Coll. Med., Gainesville, Fla.) and J. E. Johnson III. *Gastroenterology* 57(5):579-586, 1969.

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0297 ONE STAGE VERSUS TWO STAGE PANCREATO-DUODENECTOMIES FOR PERIAMPULLARY TUMORS. *(E.)* McClelland, R. N. (no affil). *Surg Gynec Obstet* 129(6):1268-1269, 1969.

0298 POSTVAGOTOMY-PYLOROPLASY DUMPING AND DIARRHEA. *(E.)* Dorton, H. E. (no affil). *Surg Gynec Obstet* 129(6):1267-1268, 1969.

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0301 MULTIPLE GASTRIC ADENOMATOUS POLYPS IN A DOG. *(E.)* Conroy, J. D. (Dept. Vet. Path. Hyg., U. Illinois, Urbana, Ill.). *J Comp Path* 79(4):465:467, 1969.

0302 AN ENDOSCOPIC RECOGNITION OF THE ATROPHIC BORDER AND ITS SIGNIFICANCE IN CHRONIC GASTRITIS. *(E.)* Kimura, K. . (Fac. Med., Tokyo U., Japan) and T. Takemoto. *Endoscopy* 7(3):87-97, 1969.

0303 THE HERKSHEIMER-MANSFELD PHENOMENON AFTER PANCREATODUODENECTOMY. *(Ser.)* Jurkovic, M. (Gen. Hosp., Subotica, Yugoslavia) and E. Libman. *Med Glas* 22(11):375-377, 1969.

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0306 ALCOHOL AND THE ACCIDENT DEPARTMENT. *(E.)* Watson, J. P. (Bethlem Roy and Maudsley Hosp., London, England). *Brit J Addict* 64(2):223-230, 1969.

0307 AN INFLUENCE OF ANTICHOLINERGIC DRUGS ON THE PREVENTION OF EXPERIMENTAL GASTRIC JLCER IN THE RAT. *(Kor.)* Chung, K. W. (Catholic Med. Coll., Seoul, Korea), K. M. Lee and S. C. Hwang. *Korean J Int Med* 12(7):495-500, 1969.

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0309 SELECTIVE USE AND PERFORMANCE POTENTIAL OF THE GASTRO-CAMERA IN GASTRIC DIAGNOSIS. *Ger.)* Wiendl, H. J. (Surg. Clin., Tech. U., unich, Germany). *Munchen Med Wschr* 111(44):2302-306, 1969.

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0316 ACTION OF ULTRAVIOLET RADIATION ON THE FORMATION OF A CONSTRICTED ULCER IN A WHITE RAT. *(Fr.)* Dumas, J. (Lab. Comp. Gen. Physiol., Lyon, France) and G. Peres. *C R Soc Biol* 163(4):863-865, 1969.

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0332 PERITONEAL AND OBSTRUCTIVE COMPLICATIONS IN THE ELDERLY AFTER GASTRO-DUODENAL SURGERY. *(Sp.)* Gugliotella, H. G. (Hosp. Rawson, Buenos Aires, Argentina) and A. M. Paladino. *Prensa Med Argent* 56(18):821-823, 1969.

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See also: 0019 (P:Morph) • 0042,0044,0046,0050,0051 (P:Mptil) • 0069,0077 (D:Secr:Stom) • 0183,0189,0192,0200,0203,0206,0212,0214,0215, 0227,0228,0230 (Diagproc) • 0235,0262,0267 (D:Esoph) • 0359, 0364,0368 (D:S.Intest) • 0503,0508 (D:Pancreas) • 0587 (D:Livbil:Nonv.Hep) • 0687,0690,0695,0709 (D:Gen)

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OPERATIONS FOR CHRONIC DUODENAL ULCER.
Ger.) Kronborg, O. (Bispeberg Hosp., Copenhagen,
enmark). *Bruns Beitr Klin Chir* 217(6):492-494,
969.

ollow-up studies 42 months postoperatively in
38 patients showed recurrence of duodenal ulcers
9 patients, gastrojejunal ulcers in 2, and
loric stenosis in 2. Postcibal symptoms in-
uding dumping, intermittent vomiting and epi-
stric discomfort were reported relatively
equently but were severe in only 12% of the
ses. Anemia diagnosed in 19 patients respon-
d to iron therapy in all but one. Weight loss
s significant in 2 cases and steatorrhea did
t occur.

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OF DIARRHEA IN THE VAGOTOMIZED PATIENT.
p.) Cascon, A.D. (Milit. Hosp. Generalisimo,
rcelona, Spain), J.C. Samper and J.V. Sans.
Exp Enferm Apar Dig 29(3):367-386, 1969.

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APPRAISAL OF THE EFFECTS OF VAGOTOMY:
RIOUS PARAMETERS AND THEIR RELATION TO PREVIOUSLY
TABLISHED CASES OF PERSISTENT OR CHRONIC DUODENAL
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59.

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(1st. Gen'l Surg. Clin., U. Milan, Italy), G. Gibelli, A. Bastagli and M. Galeone. *Arch Ital Chir* 95(1):68-81, 1969.

0347 GASTRODUODENAL ULCER. *(It.)* De La Pierre, M. (Inst. Clin. Med. Terap. Med., U. Torino, Italy) and G.C. Bruno. *Aggior Clinicoter* 10(7):1-132, 1969.

0348 ACUTE COMPLICATIONS OF GASTRO-DUODENAL ULCER: A THERAPUTIC APPROACH. *(Rum.)* Butureanu, Vl. (Inst. Med. Pharm. Iasi, Rumania), C. Lazar, D. Dragomire, C. Dolinescu and E. Veisa. *Rev Medicochir Iasi* 73(3):607-612, 1969.

0349 GASTRIC SECRETION ANALYSIS WITH REGARD TO INDICATIONS CONCERNING OPERATIVE AND POST-OPERATIVE TREATMENT OF ULCER. *(Ger.)* Christiian, P.M. (Bispebjerg Hosp., Copenhagen, Denmark). *Bruns Beitr Klin Chir* 217(6):485-491, 1969.

0350 VAGOTOMY COUPLED WITH PYLOROPLASTY FOR THE TREATMENT OF PERFORATION OF DUODENAL ULCER. *(Pol.)* Wysocki, A. (Surg. Clin. Cracow, Poland) and W. Czechowicz. *Pol Przegl Chir* 41(9): 1282-1285, 1969.

0351 GASTRIC AND DUODENAL ULCERATIONS IN PATIENTS WITH CIRRHOSIS AND CHRONIC HEPATITIS. *(Rum.)* Paun, R. (Dr. I Cantacuzino Hosp., Bucharest, Rumania), M. Stanescu, R. Lazarescu, M. Titeica, N. Luca, O. Macarie and E. Radulescu. *Med Intern* 21(8):937-946, 1969.

0352 HEMORRHAGE AND PERFORATION COMPLICATING PEPTIC ULCER IN PREGNANCY. *(E.)* Jones, P.F. (Aberdeen Gen. Hosp., Scotland), A.B. McEwan and R.M. Bernard. *Lancet* (7616):350-351, 1969.

0353 PROTEIN LOSS IN PATIENTS OPERATED ON FOR GASTRODUODENAL ULCER. *(Por.)* Rosenberg, D. (Med. Fac., U. Campinas, S. Paulo, Brazil), N. Carvalho, F. Secaf and L. Rosenberg-Aratangy. *Arq Gastroent* 6(3):127-132, 1969.

0354 MAXIMUM HISTAMINE TEST AND TYPES OF GASTRIC SECRETION IN PEPTIC ULCERS. *(Rus.)* Fisher, A.A., (Kubanskii, Med. Inst., Krasnodar, U.S.S.R.) and N. Kh. Fokicheva. *Ter Arkh* (9):96-101, 1969.

See also: 0042,0048 (P:Motil) • 0181,0219 (Diagproc) • 0271 (D:Stomduo)

0355 NON-SUTURE METHOD OF PLICATION OF THE SMALL BOWEL. *(E.)* Richard, N. F. (Inlow Clin., Shelbyville, Ind.) and W. L. Green. *Int Surg* 52(6):489-493, 1969.

A method for the treatment of acute and chronic small bowel obstruction was tested in 18 patients. A nasogastric tube was passed to empty the stomach, and a midline or paramedian incision was made. An opening was made in the anterior stomach wall near the pylorus, and a specially designed tube (a modification of the Miller-Abbott tube with 48 holes one-half inch apart proximal to the mercury bag) was passed through to the jejunum. The long tube was left in position for an average of 12 days and either withdrawn in retrograde fashion or cut off at the skin level to be passed rectally. Complications included a ruptured sigmoid diverticulum, aspiration pneumonia, gastrointestinal bleeding, and a knot in the tube.

0356 LACTASE DEFICIENCY AND A LACTOSE-FREE DIET IN PATIENTS WITH "UNSPECIFIC ABDOMINAL COMPLAINTS". *(E.)* Jussila, J. (Children's Hosp., Helsinki, Finland), K. Launiala and O. Gorbatow. *Acta Med Scand* 186(3):217-222, 1969.

Small-intestine biopsies were taken from the jejunum of 41 patients with unspecific abdominal complaints lasting at least 1 month. Light microscopy in one-half revealed no villous changes in any of the patients, but 3 had increased round cell infiltration of the lamina propria. Lactase activity was determined in the biopsy by a modification of the Dahlqvist method. Twelve of the patients had low jejunal lactase activity (<1.5 U) and all of these, but none of the others, had a low lactase-to-sucrase ratio (<0.3). Only 2 of the 12 patients had a history of milk intolerance. Over a period of 3 weeks, the patients observed a lactose-free diet for 1 week, their customary diet for the 2nd week, and the lactose-free diet for the 3rd week. During the 1st lactose-free week, the symptoms were lessened in 8 and totally disappeared in 2 patients with low lactase activity; during the 2nd lactose-free week the abdominal symptoms lessened in 6 patients and totally disappeared in another 6. The symptoms were aggravated in 10 patients with low lactase activity during the intermediate week, but the remaining 2 patients refused to drink milk. Seven of the patients with normal lactase activity had lessened symptoms and 2 had no abdominal symptoms after each week of the lactose-free diet. Eleven patients with low lactase activity continued the lactose-free diet for 6 months, at the end of which no abdominal symptoms were noted. When the patients were challenged with 2 glasses of milk a day for 3 consecutive days, 8 patients had abdominal complaints.

0357 SURGICAL ASPECTS OF RADIATION ENTERITIS. *(E.)* Localio, S. A. (New York U. Sch. Med., N. Y.), A. Stone and M. Friedman. *Surg Gynec Obstet* 129(6):1162-1172, 1969.

Ten patients with disabling symptoms of progressive radiation enteritis, which appeared 8 months-22 yr following irradiation for various carcinomas, were treated surgically with success. Several of the patients initially were thought to have partial obstruction or other symptoms secondary to recurrent cancer. Surgery included 1 or more of the following procedures: sigmoid resection, ileal resection, colostomy, subtotal gastrectomy, fistula resection and hemicolectomy. In 2 of the patients, surgery revealed colonic carcinoma which had developed in areas exposed to radiation 19-23 yr previously. None of the patients died in the immediate period. In 2 of the patients, surgical intervention arrested the disease for 10 yr. Surgery is recommended for severe radiation enteritis, but may be associated with metabolic and nutritional problems if resection is extensive.

0358 SMALL INTESTINAL MUCOSA IN CHOLESTEROL ESTER STORAGE DISEASE. *(E.)* Partin, J. C. (Child. Hosp. Res. Foundation, Cincinnati, Ohio) and W. K. Schubert. *Gastroenterology* 57(5): 542-558, 1969.

The intestinal lesion in cholesterol ester storage disease is described in 2 patients. The duodenal and jejunal epithelium is morphologically normal by light and electron microscopy. The lamina propria is abnormal; the villus core contains increased cholesterol ester and carotenes. This is reflected at the electron microscope level by the presence of crystal-like profiles in the interstitium and masses of foam cells which form a cap surrounding the lacteal. The lacteal endothelium contains stored lipid. Mucosal smooth muscle and vascular pericytes contain nonosmiphilic lipid droplets and strongly resemble vascular smooth muscle in atherosclerosis. The metabolic defect underlying these observations is unknown but since serum lipoproteins are normal, a block in the transport of cholesterol across the lacteal not dependent upon the plasma lipoprotein system is postulated.

0359 HEMODYNAMICS OF EXPERIMENTAL INTESTINAL OCCLUSION. I. OBSTRUCTION AT THE LEVEL OF THE DUODENOJEJUNAL ANGLE. *(It.)* Becchi, G. (Inst. Clin. Surg., U. Genoa, Italy) and E. Berti-Riboli. *Chir Pat Sper* 16(5):420-434, 1968.

First of a two-part study on the behavior of regional splanchnic blood flow, systemic arterial pressure and cardiac output in dogs after acute tying (group I, 6 animals) or chronic gradual closure (group II, 10 animals) of intestinal lumen by a circular constricting band. In the acute experiment that covered a 4 hr observation period, cardiac output and systemic arterial pressure decreased slightly, i.e. by 6 and 8% of initial values, resp. Within 30 min of obstruction, the pressures in the superior mesenteric and pancreaticoduodenal arteries increased abruptly by 10% but returned to normal at 60 min for the duration of the study. Pressure increase was associated

ith a simultaneous 15% reduction in arterial flow.
.ow behavior in the superior mesenteric vein
ralleled that of the artery. In the chronic
periment, an initial flow increase in the ar-
erial bed was paralleled by decreased resistance
d increased systemic pressure. At the end of
e first day however, all parameters including
gional arterial pressures and blood flow, sys-
mic pressure and cardiac output began to de-
ine continuously and progressively up to the
rmination of the experiment by death of the
imals. Vascular resistance in the splanchnic
terial bed was always rather low and the de-
ine in arterial blood flow was approximately
oportional to that in cardiac output.

60 HEMODYNAMICS OF EXPERIMENTAL INTESTIN-
AL OCCLUSION. II. OBSTRUCTION AT THE
VEL OF LAST ILEAL LOOP. *(It.)* Berti-Riboli, E.
nst. Clin. Surg., U. Genoa, Italy) F. Molfino
d G. Becchi. *Chir Pat Sper* 16(6):547-552, 1968.

cond of a two-part study was concerned with the
avior of pressure and blood flow in the super-
mesenteric artery, systemic arterial pressure
d cardiac output in dogs after acute (group I,
logs) and chronic (group II, 6 dogs) ileal oc-
sion produced by tying off the ileal loop with
ircular band or by placing a knot around the
eum and gradually tightening the knot to com-
ete the obstruction. In the acute experiment,
hemodynamic parameters decreased slightly and
dually during the 4-hr observation period with-
exhibiting any abrupt changes. The mean re-
tions in mesenteric artery pressure and flow,
temic pressure and cardiac output were 3.2,
, 2.7 and 3.8%, resp. During the first 48 hr
the chronic experiment, arterial flow in the
ion of the superior mesenteric artery increased
resistance decreased. Flow increase reached
aximum of 20% at 6 hr and declined gradually
reafter followed by an abrupt decline in flow
increased vascular resistance on the third day.
se changes became more accentuated and persisted
to the death of the animals between day 6 and 7
the experiment. The simultaneous gradual fall
cardiac output to 75% of basal values by the
of the observation period was accompanied ini-
lly by an increase, and later, by a slight de-
ase in peripheral resistance. Flow conditions
the superior mesenteric vein paralleled those
the artery increasing by 18% at 6 hr.

1 SMALL INTESTINAL ATRESIA AND STENOSIS.
(E.) Mishalany, H. (Amer. U. Hosp.,
rut, Lebanon) and F. Najjar. *J Med Liban* 21(5):
-230, 1968.

nical symptomatology, treatment and etiology
16 cases of small intestinal atresia (pre-
inately jejunal) and 2 cases of stenosis are
cribed. Atresia was detected within the first
of life and stenosis within the fourth week;
atients were premature infants. Symptoms of
esia included passage of meconium at birth,
jaundice, high blood bilirubin levels and urea retention. Diagnosis of atresia and stenosis was done by a flat film of the abdomen. Duodenal atresias and stenosis were treated by duodenoenterostomy whereas jejunal and ileal atresias and stenosis were treated by excision of the atretic or stenotic segment along with a segment of the proximal dilated loop of the bowel. Close parental sanguinity was present in 5 cases and there were 3 cases of identical atresias in one family, possibly indicating a genetic cause of atresia of the small intestine.

0362 DISRUPTION OF THE RESORPTIVE CAPACITY OF THE INTESTINE AND THE VITAMIN B12-CONTENT OF THE BLOOD SERUM OF HEALTHY CHILDREN AND OF PATIENTS SUFFERING FROM HYMENOLEPIDOSIS. *(Rus.)* Avenirova, A. I. (Med. Inst. Alma Ata Kazakh SSR, USSR) and K. A. Katsyuba. *Med Parazit* 38(5):529-531, 1969.

0363 ROENTGENOLOGIC ASPECTS OF MECKEL'S DIVERTICULUM. *(E.)* Corley, K. C. (Doctors Hosp., Washington, D. C.). *Med Ann D C* 38(11):592-596, 1969.

0364 RECURRENT ILEUS AND RESPIRATORY DISTURBANCES IN THE COURSE OF STAPHYLOCOCCAL GASTROENTERITIS. *(It.)* Sartorelli, C.(Pediat. Clin., U. Padua, Italy) and B. DeBernardi. *Vene Sci Med* 23(9-10):547-550, 1968.

0365 THE USE OF FLUIDS AND ELECTROLYTES IN THE MANAGEMENT OF ILEUS. *(E.)* Cromer, J. K. (Doctors Hosp., Washington, D. C.) and J. Trinidad. *Med Ann D C* 38(11):613-617, 1969.

0366 A SURVEY OF ACUTE GASTROENTERITIS IN GENERAL PRACTICE. *(E.)* Finckh, E. S. (Dept. Path., U. Sydney, Australia), G. E. C. Simpson and G. S. Nagy. *Med J Aust* 2(13):633-635, 1969.

0367 MECKEL'S DIVERTICULUM IN AN ADULT WITH MASSIVE BLEEDING. *(E.)* Wilk, H. Wilmington Med. Ctr., Wilmington, Delaware) and Z. Hossain. *Delaware Med J* 41(11):321-323, 1969.

0368 AN EXPERIMENTAL EPIDEMOLOGICAL STUDY OF PORCINE TRANSMISSIBLE GASTROENTERITIS. *(E.)* Derbyshire, J. B. (Agric. Res. Council., Compton, Berks., England), D. M. Jessett and G. Newman. *J Comp Path* 79(4):445-452, 1969.

0369 LARGE AMOUNTS OF ORALLY ADMINISTERED BARIUM FOR OBSTRUCTION OF THE SMALL INTESTINE. *(E.)* Miller, R. E. (Ind. Univ. Med. Ctr., Indianapolis, Ind.) and F. Brahme. *Surg Gynec Obstet* 129(6):1185-1188, 1969.

0370 VON RECKLINGHAUSEN'S DISEASE WITH SYSTEMIC MANIFESTATIONS AND MALIGNANT CHANGES: REPORT OF A CASE. *(E.)* Alter, J. (Fort Worth Osteopath Hosp., Texas). *J Amer Osteopath Ass* 68(7):714-718, 1969.

0371 CARCINOID TUMOR IN A MECKEL'S DIVERTICULUM. *(E.)* Abramowitz, I. (Dept. Surg. U. Witwatersrand, South Africa) and I. Gien. *S Afr J Surg* 7(2):77-81, 1969.

0372 URINARY DIVERSION BY CUTANEOUS URETEROILEOSTOMY IN CHILDREN WITH MYELOMENINGOCELE. *(E.)* Herzberg, S. B. (University Hosp., Cleveland, Ohio), L. Persky and F. E. Nulsen. *Amer J Dis Child* 118(6):876-885, 1969.

0373 PROPHYLAXIS AND TREATMENT OF ENTERITIS IN SUB-TROPICAL COUNTRIES. *(Ger.)* Keul, J. (U. Med. Clin., Freiburg, Germany), J. Nöcker and H. Reindell. *Med Klin* 64(46):2145-2148, 1969.

0374 ILEOINTRACOLIC INVAGINATION OF A MECKEL'S DIVERTICULUM. *(Fr.)* Metairie-Simon, P. (Central Hosp. Montfermeil) and G. C. Simon. *Sem Hop Paris* 45(41):2547-2548, 1969.

0375 COMPARATIVE EVALUATION OF CHOLEODOCHODUODENOSTOMIES AND SPHINCTEROTOMIES PERFORMED IN CASES OF PAPILLOSTENOSIS. *(Hun.)* Szeleczky, G. (Med. Clin. Debrecen, Hungary) and T. Nagy. *Magyar Seceszet* 22(5):273-281, 1969.

0376 POSTOPERATIVE STAPHLOCOCCUS ENTERITIS. *(Sp.)* Miro, R. G. (Service Urgent Surgery Social Security, Barcelona, Spain) and R. G. Reyero. *Anal Med* 55(3):291-297, 1969.

0377 BLEEDING MECKEL'S DIVERTICULUM WITH PANCREATIC HETEROTOPIA. *(It.)* Montagnini, R. (1st Inst. Surg. Path., U. Rome, Italy), A. Mancia and E. Crisci. *Ann Ital Chir* 44(6):999-1012, 1969.

0378 INTESTINAL INVAGINATION IN AN ADULT. *(It.)* Armillei, E. (Inst. Gen'l Surg. Clin. Surg. Therap., U. Bologna, Italy) and G. M. Brengola. *Riv Path Clin* 23(9):729-741, 1968.

0379 MULTIPLE INVAGINATIONS OF THE SMALL INTESTINE DUE TO A FOREIGN BODY WITHIN THE DIGESTIVE TRACT. *(Pol.)* Czarnecki, B. (Wiezen Hosp., Lodz, Poland), Z. Jasniewicz and J. Rylski. *Pol Przegl Chir* 41(9):1315-1316, 1969.

0380 CONCERNING NONTUMEROUS ILEAL STENOSES. *(Fr.)* Lescut, J. (80 Saly Blvd., Valenciennes, Paris) and J. Charles. *Sem Hop Paris* 45(41):2531-2533, 1969.

0381 RECURRENT STENOSIS OF THE JEJUNUM. *(Fr.)* Chatelin, C. L. (Central Hosp. Princess Grace, Monaco). *Sem Hop Paris* 45(41): 2534-2538, 1969.

0382 SURGICAL TREATMENT OF CONGENITAL INTESTINAL OBSTRUCTION IN NEWBORNS. *(Pol.)* Giźycka, I. (Clin. Child. A. N., Warsaw, Poland), Z. Kaliciński, A. Wagner and Z. Grodner. *Pol Przegl Chir* 41(9):1303-1309, 1969.

0383 NONSPECIFIC ULCERS OF THE SMALL INTESTINE. *(Rus.)* Tretyakov, N. I. (M. I. Kalinin Hosp. Kalinin-grad, USSR) and Ya. I. Grinberg. *Khirurgiia* 45(10):90-92, 1969.

0384 CONCERNING THE LEIOMYOMATA AND NEURINOMATA OF THE SMALL INTESTINE. *(Fr.)* Lifrance, M. (Liege, France). *Rev Med Liege* 24(21): 769-772, 1969.

0385 CARCINOID TUMOR AND AN EXTRANEOUS BODY IN THE SMALL INTESTINE: A DIAGNOSIS IN THREE STAGES. *(Fr.)* Roux, M. (Hosp. Vaugirard, Paris, France), P. Vayre and N. Battesti. *Sem Hop Paris* 45(41):2553-2554, 1969.

0386 CANCEROUS TUMORS OF THE SMALL INTESTINE. *(Fr.)* Duret, P. (no affil). *Concours Med* 91(42):7345-7353, 1969.

0387 GALLSTONES: REPORT OF 22 OBSERVATIONS. *(Sp.)* Artusi, G. R. (Ramos Mejia Hosp., Buenos Aires, Argentina), J. C. Etchebarne and A. R. C. Artusi. *Prensa Med Argent* 56(22):1042-1045, 1969.

0388 JEJUNAL PHLEGMON PRODUCED BY A LARVA OF *ANISAKIS*. *(Fr.)* Fain, A. (Inst. Trop. Med. Antwerp, Belgium), M. Van Roy and E. Fontenelle. *Louvain Med* 88(7):579-587, 1969.

0389 ILEOCECAL TUBERCOLOSIS. *(Sp.)* González Vales, H. (Surg. Clin., Montevideo, Uraguay) and S. A. Souza. *Torax* 18(2):111-114, 1969.

0390 SECONDARY ILEOCOLIC INVAGINATION DUE TO AN ILEOCOCAL LYMPHOSARCOMA. *(Fr.)* Dreze, Ch. (Clin. St. Joseph, Liege, France), A. Cornil and L. Lewalle. *Acta Gastroent Belg* 32(9): 679-683, 1969.

391 CONSERVATIVE TREATMENT FOR SOME FORMS OF INTESTINAL OBSTRUCTION. *(Pol.)* likowski, A. (J. Snaidecki Dist. Hosp., Bialostok, oland) and Z. Korfel. *Pol Przegl Chir* 41(9):1244-247, 1969.

92 THERAPY OF INTESTINAL CARCINOIDOSIS. *(It.)* Grossi, F. (Inst. Therap. Med., Rome, Italy) and M. Grassi. *Clin Ter* 50(5):475-0, 1969.

93 CURRENT CLINICOBACTERIOLOGIC AND THERAPEUTIC ASPECTS OF JUVENILE ENTEROCOLI- S. *(Rum.)* Gavrila, I. (Infectious Dis. Clin., uj, Rumania), O. Suciu, C. Pirvu, M. Bâlcea and Campeanu. *Pediatria (Bucur)* 18(1):63-72, 1969.

0394 ROLE OF *SALMONELLA PANAMA* IN THE ETIOLOGY OF INFANTILE ENTEROCOLITIS. *(Rum.)* Szabó, I. (Infectious Dis. Clin., Tirgu Mures, Rumania), R. Ionescu, P. Székely, Gy. Konrád and L. Kelemen. *Pediatria (Bucur)* 18(1):57-62, 1969.

0395 HISTOCHEMICAL STUDY OF THE RELATION BETWEEN INTESTINAL POLYPOSIS AND THE EVOLUTION OF CANCER. *(It.)* D'Alonzo, U. (Hospital S. Gerardo dei Tintori, Monza, Italy. *Chir Pat Sper* 16(5):468-480, 1968.

0396 SOLITARY ULCER OF THE SMALL INTESTINE. *(It.)* Pagliuca, V. (Civil Hosp., St. Maria, Italy) and O. Diotallevi. *Osped Ital Chir* 20(5):387-391, 1969.

See also: 0049 (P:Motil) • 0060 (P:Secr) • 0161,0165 (P:Secr:Intest) • 0179,0232 (Diagproc) • 0254 (D:Esoph) • 0272,0286,0303,0331,0334 (D:Stomduo) • 0430,0438,0473 (D:L.Intest) • 0503 (D:Pancreas) • 0666 (D:Livbil:Gallb) • 0689,0690,0709 (D:Gen) • 0720 (D:Gen:Parasit)

Regional Enteritis

0397 AZATHIOPRINE FOR CROHN'S DISEASE. *(E.)* Brooke, B. N. (St. George's Hosp., London, England), D. C. Hoffman and E. T. Swarbrick. *Lancet* II(7621):612-614, 1969.

Azathioprine, 4 mg/kg p.o. for 10 days, followed by a maintenance dosage of 2 mg/kg, was administered to 6 patients with Crohn's disease who had proven refractory to usual forms of treatment (steroids and surgery). Two patients had serious multiple intestinal fistulae, 2 had persistent anal fistulae and fecal incontinence, and the remaining 2 had prolonged and intractable disease. Following treatment, the fistulae healed in the 4 patients involved, and marked improvement was noted in all 6 patients. Improvement may have been brought about by immunosuppression or by the anti-inflammatory effect of the drug; evidence favors the former. Long-term effects of the drug are unknown as treatment has not continued longer than 6 months in any of the cases.

0398 KVEIM TEST IN CROHN'S DISEASE. *(E.)* Mitchell, D. N. (Brompton Hosp., London, England), P. Cannon, N. H. Dyer, K. F. W. Hinson and J. M. T. Willoughby. *Lancet* II(7620):571-573, 1969.

Because of the similarity between the focal granulomas of Crohn's disease and those of sarcoidosis, Kveim tests were performed on 48 patients with Crohn's disease (5 of whom received steroids during the period of testing). The test material was given intracutaneously (0.15 ml) and a full-thickness skin-punch biopsy (4 mm) was taken 4-6 weeks after injection. Microscopically positive Kveim tests occurred in 24/48 patients. Among 24 patients with histologically confirmed Crohn's disease, 10 were positive; among the 14 with a clinically confirmed diagnosis, 9 were positive. Of the 5 patients receiving steroids, 1 had a positive test, 1 had an equivocal test, and 3 had negative results. Possible explanations for the findings include: cross-reactivity between sarcoidosis and Crohn's disease antigens, an etiological agent common to the two diseases, or a property of the Kveim test material used in the series.

0399 AZATHIOPRINE FOR CROHN'S DISEASE. *(E.)* Jones, F. A. (Central Middlesex Hosp., London, England), P. Brown, J. E. Lennard-Jones, J. H. Jones and G. J. Milton-Thompson. *Lancet* II (7624):795, 1969.

0400 CEROID DEPOSITION IN THE MUSCULARIS OF THE SMALL INTESTINE, ASSOCIATED WITH REGIONAL ENTERITIS. *(E.)* Papp, J. P. (1245 Ravenwood Ave., Ann Arbor, Mich.), R. G. Farmer and W. A. Hawk. *Cleveland Clin Quart* 36(4):189-194, 1969.

0401 HIGH JEJUNAL STENOSIS: CROHN'S DISEASE. *(Fr.)* Grosdidier, J. (Hosp. Marin, Paris, France), F. Watelet, D. Robert and R. Parietti. *Sem Hop Paris* 45(41):2539-2540, 1969.

See also: 0438,0467,0472,0473 (D:L.Intest)

02 MALABSORPTION SYNDROME IN PARTIAL IMMUNOGLOBULIN DEFICIENCY (IgA DEFICIENCY).

er.) Wagner, A. (Med. Polyclin., U. Heidelberg,
rmany) and H.D. Grossman. *Deutsch Med Wschr* 94
0):2023-2028, 1969.

duction or complete absence of IgA was found in
ree patients with primary malabsorption syndrome.
arrhea and the resulting deficiency syndromes
veloped in these patients only later in adult
fe, after normal development during childhood.
ntrary to patients with celiac disease persis-
ng beyond childhood, these patients had
casionally watery diarrhea and their fecal fat
cretion was lower (36-38% of fecal dry weight).
e patient responded favorably to gluten-free
et and substitution therapy with oral potassium,
tamins, and iron. The incidence of steatorrhea in
% of patients with complete antibody deficiency
ggest causal connections between steatorrhea and
A deficiency.

03 LACTOSE MALABSORPTION IN GREENLAND ESKIMOS.

(E.) Gudmand-Hyer, E. (Rigshos-
talet, Copenhaven, Denmark) and S. Jarnum.
ta Med Scand 186(3):235-237, 1969.

e incidence of intestinal lactase deficiency and
ctose malabsorbtion was studied in 32 Greenland
kimos (7 With European ancestors and 25 "pure"
kimos) by the use of lactose and glucose-galac-
se tolerance tests and by peroral jejunal biopsy
9 cases. None of the subjects had malabsorbtion
other signs of small intestinal disease.
ucose-galactose tolerance tests (performed with
g glucose and 50 g galactose taken with water
ally followed by blood samples drawn at 15, 30,
, 90, and 120 min) were normal in all 21 patients
sted. Sucrose tolerance tests (performed simil-
y with 100 g sucrose) were normal in all 17
tients tested, while lactose tolerance tests
T) performed similarly with 100 g lactose
wed a flat blood glucose curve (less than a 25
rise of glucose per 100 ml blood) in 22/25 (88%)
kimos without European ancestors, but in only 1
kimo with European ancestry (total of 72% of the
patients). Seventeen of 23 patients with flat
curves had diarrhea and/or abdominal discomfort
ring the LTT. Of 9 jejunal biopsies performed,
showed abnormally low jejunal mucosal activity
rom 0 to 3 μ/g protein) as performed by Dahlqvist's
step method. Mucosal sucrase and maltase
hlqvist method) activity was normal in all 9
es.

4 MALABSORPTION IN JOHNE'S DISEASE IN CATTLE: AN *IN VITRO* STUDY OF L-HISTIDINE
AKE BY ISOLATED INTESTINAL TISSUE PREPARATIONS.

) Patterson, D.S.P. (Central Vet. Lab., Weybridge,
land) and S. Berrett. *J Med Microbiol* 2(3):327-
, 1969.

gs of whole ileum or mucosal scrapings from 10
nical cases of Johne's disease, or from 2 subclinically infected cows, accumualte L-histidine at considerably less than the normal rate when incubated in Krebs-Ringer bicarbonate solution containing this amino acid at a concentration of 20 mM. "Active" uptake of histidine against a concentration gradient can be abolished by the addition of 0.2 mM dinitrophenol to the incubation medium. The proportion actively accumulated was about 61% in normal mucosal scrapings; however, it was only 25% in specimens obtained from clinically affected cattle. In the same tissue preparations, the mean total rate of histidine accumlation was almost halved, but its passive uptake was virtually unaffected, indicating that, in infected cattle, histidine probably diffused into the mucosal cells normally. By direct microscopic measurement, it was found that the thickness of the mucosal tissue layer in the ileum was not significantly greater in clinically affected cattle than in healthy controls. The weight of ileum per unit length was on the average, increased almost four times on account of massive submucosal infiltration. The marked reduction in the "active" uptake of histidine by the mucosa from infected animals is indicative of a malabsorption state.

0405 CATAMNESTIC INVESTIGATIONS OF ADOLESCENTS WITH CELIAC DISEASE.

(Ger.) Weber, A. (Med. Clin., U. Marburg-Lahn, Germany). *Deutsch Med Wschr* 94(43):2206-2211, 1969.

The majority of 11 former patients who had suffered from celiac disease in infancy or childhood had no digestive disturbances at a follow-up several years later. Only two patients continued to adhere to the prescribed diet while the remaining had taken the gluten-free diet only temporarily. Two of the 4 patients who were available for clinical study were well, had no clinical symptoms and showed normal development. The two other patients exhibited delayed physical development associated with a pronounced malabsorption syndrome in one instance. However, subtotal atrophy of the intestinal villi was diagnosed by jejunal biopsy in all 4 patients. Successfully treated celiac disease may remain symptom-free for prolonged periods even after discontinuation of the gluten-free diet, but continuous medical surveillance is necessary because of possible recurrences with a severe malabsorption syndrome.

0406 ALCOHOL-INDUCED MALABSORPTION OF VITAMIN B_{12} IN MAN.

(E.) Lindenbaum, J. (Dept. Med., Columbia U., New York, N.Y.) and C.S. Lieber. *Nature* 224(5221):806, 1969.

The effect of alcohol ingestion on vitamin B_{12} absorption was studied in 4 asymptomatic, hematologically normal adult male chronic alcoholics with normal liver biopsies. Multiple vitamin supplements, including folic acid, were given through 3 study periods (pre-ethanol control ethanol, and post-ethanol control). Protein comprised 12.5 and 25%

of the total caloric intake in 2 patients each. For 3-8 weeks ethanol was substituted isocalorically for carbohydrate in a maximum daily dose of 158-253g. Following p.o. administration of ^{57}Co-cyanocobalamin (0.75 μg; specific activity 1 μCi/μg) the urinary excretion of ^{57}Co-vitamin B$_{12}$ was less during the ethanol periods than during the control periods for all the subjects. The average decrease in excretion of the vitamin during alcohol periods of 13-34 days was 41.5% (22.9-52.7%) for 24 hour urines and 34.7% (17.1-47.5%) for 48 hour urines. When fecal radioactivity was tested in 1 subject, it was found to be higher during the ethanol period (41.3%) than the pre-ethanol period (17.7%) or post-ethanol period (34.4%). Impairment of ileal function by ethanol was further suggested by the presence of dilated endoplasmic reticulum and focal cytoplasmic degradation in a biopsy specimen from 1 subject on the 51st ethanol day.

0407 SERUM-IMMUNOGLOBULINS IN ADULT CELIAC DISEASE.

(E.) Asquith, P. (Dept. Exper. Pathol., U. Birmingham, England), R. A. Thempson and W. T. Cooke. *Lancet* II(7612):129-131, 1969.

Serum immunoglobulin (IgG, IgA, IgM, IgD) levels were compared in 152 control subjects and in 110 patients with biopsy-proven adult celiac disease (58 were treated for 6 months with gluten-free diet). Serum IgD levels were the same in all patients and controls. Serum IgG and IgM levels were higher in controls than in patients, with no difference in the levels between treated and untreated patients. Serum IgA levels were higher in untreated patients than in treated patients and controls. Ten previously untreated patients were put on a gluten-free diet and immunoglobulin levels were measured monthly. There was a mean progressive significant increase in IgG levels, a progressive but insignificant decrease in IgA levels, and an unsustained insignificant increase in IgM levels. Gastrointestinal lymphoma developed in 3 patients who exhibited a progressive increase in serum IgA levels.

0408 CELIAC DISEASE IN A DIABETIC CHILD.

(E.) Hooft, C.(Dept. Pediat. State U., Ghent, Belgium), E. Devos and J. van Damme. *Lancet* II(7612):161, 1969.

Gastrointestinal function tests were performed on 6 diabetic children. Two had never received insulin; the other 4 had been treated with insulin for 3 months to 7 yr, but were difficult to control. Steatorrhea (5 g fat or more per 24 hr) and an increased excretion of lactic acid (500 mg or more per 24 hr) were found in 3 patients, including 1 not treated with insulin. Two of the 3 patients also showed an increased fecal excretion of glucose (100 mg/100 g and 200 mg/100 g). Small bowel biopsy showed flattening of the villi with edema and infiltration of the lamina propia in 2 patients, including 1 untreated patient.

0409 INTRALUMINAL BILE-SALT DEFICIENCY IN THE PATHOGENESIS OF STEATORRHEA.

(E.) Badley, W.D. (Royal Free Hosp., London, England), G.M. Murray and I.A.D. Bouchier. *Lancet* II(7617):400-402, 1969.

The lipid-solvent properties of samples of jejunal aspirates from a normal volunteer and from a patient with chronic hepatitis (who secreted 15-20 g of fat in 24 hr) were investigated. The lipase in the jejunal aspirates was inactivated by heat. A lipid mixture (20% corn oil, 25% mono-olein, 55% oleic acid) was added in increasing amounts to several equal aliquots of the aspirates, which were then incubated at 37 C for 1 hr. The The micellar phase was separated by centrifugation at 100,000 g for 3 hr. The lipid content of both phases was measured gravimetrically and the total bile-salt concentration was measured by a modification of the hydroxy-steroid-dehydrogenase method. The total bile-salt concentrations of 2 pooled collections from the normal subject were within normal range (11.5 and 5.5 mM/l hr), as compared with that of the patient with steatorrhea (3.5 mM/l hr). At all three concentrations there was a micellar phase. However, in the 2 normal samples, throughout the normal total-lipid range, increase in total lipid content was matched by a proportionate increase in micellar assimilation. In the sample with subnormal bile-salt concentration, micellar-lipid incorporation was maximal around the mid-point of the normal total-lipid range and then decreased. The concentration of conjugated bile salts must exceed 4 mM per liter to provide an adequate number of micelles to dissolve the hydrolytic products of a normal dietary lipid load. Failure to achieve this critical physiological concentration of bile salts will, despite achievement of the critical micellar concentration, results in steatorrhea.

0410 OSSEOUS COMPLICATIONS OF STEATORRHEA: REPORT OF TWENTY CASES.

(Fr.) Pansu, D., M.C. Chapuy, P. Meunier, P. Chapuy, J. Bernard and G. Vignon. (No affil) *Lyon Med* 222(36):515-535, 1969.

Steatorrhea due to vitamin D malabsorption was associated with 3 different forms of osseous complications in 20 patients. (1) Osteomalacia, judged histologically by the presence of Looser-Milkman fissures and osteoidosis, was diagnosed in 11 female patients. Steatorrhea was secondary to gastrectomy and sprue or to unknown causes. Calcium supply in these patients was variable, vitamin D and fat supply was deficient, and exposure to the sun, indispensable to the synthesis of endogenous vitamin D, had been denied by the majority of these patients. (2) Osteoporosis, characterized by reduced osteoblastic activity, was found in 5 male and female patients. Steatorrhea was secondary to gastrectomy, sprue and unknown factors. Fat and vitamin D supply and exposure to the sun were normal, but calcium supply and absorption were deficient. (3) Osteoporomalacia, defined on the basis of reduced bone mass and associated hyperosteoblastosis, was observed in 4 patients. In 3 of these patients,

teatorrhea was accompanied by tetany. Fat,
itamin D and calcium supply appeared to be
ormal.

411 EFFECT OF VITAMIN B_{12} AND FOLIC ACID DEFICIENCY ON SMALL INTESTINAL ABSORPTION.
E.) Forshan, J. (Sefton Gen. Hosp. Liverpool,
ngland). *J Clin Path* 22(5):551-553, 1969.

ıree case reports are described of a small
ıtestinal absorption defect which was correct-
l by the administration of folic acid or vita-
in B_{12}. In the first patient, impaired absorp-
ion of both vitamin B_{12} and xylose was caused
dietary deficiency of folic acid, and in the
econd and third patients by dietary deficiency
vitamin B_{12}. In one of the latter two
tients, the initial cause of vitamin B_{12}
eficiency was not immediately apparent; this
tient was taking an oral contraceptive
ynovlar 21) which may have been an etiolo-
cal factor. In the third patient, the in-
stinal absorption defect was secondary to
rnicious anemia. In an additional study of
e effect of 60 mg of an intrinsic factor
eparation in 98 patients with pernicious
emia, absorption was not improved in 6
tients and was only partially improved in
patients.

12 POORLY ABSORBED SULFONAMIDES IN THE TREATMENT OF TROPICAL SPURE, *(E.)* Maldonado,
(U. Hosp., San Juan, Puerto Rico), E. Horta,
Guerra and E. Perez-Santiage. *Gastroenterology*
(5):559-568, 1969.

lfasuxidine or sulfaguanidine, 2-4 g/day p.o.,
s administered for 6 months to 16 patients with
opical sprue. There was progressive improvement
the general well-being, appetite and weight
in in all patients. Xylose absorption returned
normal in 12 patients and improved significant-
in 4. Steatorrhea was present in 9/12 patients
d reverted to normal in the 6 patients who had
e study performed after sulfonamide therapy.
junal biopsy improved considerably in 15 patients,
t did not return to normal. Normal hemoglobin
ncentration was observed in most patients at the
d of 6 months of therapy. Bone marrow megaloblas-
sis reverted to normoblastic in 12 patients and
mained with mild deficiency changes in 4. Serum
lic acid remained subnormal in 7/16 patients.
rum vitamin B_{12} levels returned to normal levels
9/10 patients. Hematological response was
layed in most patients and an increase in hemo-
bin occurred during the 4th - 8th week of
erapy in 6 patients who were carefully observed
the hematological response. The use of poorly-
sorbed sulfonamides in treatment of tropical sprue
advantageous since it limits antibacterial ac-
n to the gastrointestinal surface epithelium
l provides indirect evidence as to the location of the probable etiological agent in tropical sprue.

0413 PERNICIOUS ANEMIA, PARAPROTEINEMIA WITH UNUSUAL FEATURES, AND CHROMOSOME ABERRATIONS. *(E.)* Kjeldsen, K. (Fredriksborg County Hosp., Hillerd, Denmark), J. Clausen and A. Froland. *Acta Med Scand* 186(3):209-215, 1969.

0414 PERNICIOUS ANEMIA. *(E.)* Lowry, P.T.(no affil). *Minn Med* 52(11):1753-1754, 1969.

0415 EXPERIMENTAL HEPATIC STEATOSIS. *(Fr.)* Roux, G. (Dept. Physiol. Zool. Parasit., U. Toulouse, France), P. Gayrel, J.C. Dumas and J. Garigue. *Rev Med Toulouse* 5(7):573-581, 1969.

0416 BULLOUS PEMPHIGOID OF CHILDHOOD AND CELIAC DISEASE: REPORT OF A CASE. *(E.)* Meenan, F.O.C. (Child. Hosp., Dublin, Ireland) and S.F. Cahalane. *Brit J. Derm* 81(10):777-779, 1969.

0417 IMMUNOLOGICAL MYSTERY OF CELIAC DISEASE. *(E.)* Hobbs, J.R. (Roy. Postgrad. Med. Sch., London, England), G.W. Hepner, A.P. Douglas, P. A. Crabbé and S. G. O. Johansson. *Lancet* II (7621):649-650, 1969.

0418 ASSOCIATION OF MONOSACCHARIDE MALABSORPTION WITH ABNORMAL SMALL-INTESTINAL FLORA. *(E.)* Gracey, M. (Inst. of Child Health, Birmingham, England), V. Burke and C.M. Anderson. *Lancet* II(7616):384-385, 1969.

0419 SELECTIVE MALABSORPTION OF VITAMIN B12: IMERSLUND-NAJMAN-GRASBECK ANEMIA, AN OBSERVATION. *(Fr.)* Farriaux, J. P. (Ctr. Hosp., Lille, France), E. Adam, J. Swyngedous and G. Fontaine. *Presse Med* 77(40):1379-1381, 1969.

0420 MALABSORPTION SYNDROME, PROTEIN-LOSS, ENTEROPATHY AND DISTURBANCE OF HEMATOGENESIS WITH ODONTOLOXIA. *(Ger.)* Merker, H. (Med. Clin., U. Freiburg, Germany), P. Lenz, M. Helms and W. Schili. *Med Klin* 64(44):2028-2033, 1969.

0421 SINGULAR CLINICAL AND FUNCTIONAL ASPECTS IN A CASE OF IDIOPATHIC SPRUE. *(Fr.)* Celle, G. (Inst. Sci. Int. Med., U. Genoa, Italy), M. Dodero, P. Michetti and F. Neumaier. *Acta Gastroent Belg* 32(7-8):552-574, 1969.

0422 MALABSORPTION SYNDROME. *(E.)* Sleisenger, M.H. (U. California Med. Ctr., San Francisco). *New Eng J Med* 281(20):1111-1117, 1969. 1117, 1969.

0423 ILEOTRANSVERSOSTOMY AND DIGESTIVE DISORDERS IN PATIENTS AFTER RESECTION OF THE SMALL INTESTINE. *(Rus.)* Beyul, E.A. (Res. Inst., Acad. Med. Sci. U.S.S.R., Moscow). *Khirurgiia* 45 (10):86-90, 1969.

See also: 0042 (P:Motil) • 0400 (D:S.Intest:Regent)

24 INTESTINAL ANTISEPSIS: STABILITY OF
FECAL FLORA DURING MECHANICAL CLEANS-
G. *(E.)* Bornside, G. H. (Louisiana State U. Sch.
d., New Orleans) and I. Cohn. *Gastroenterology*
(5):569-573, 1969.

e effects of clindamycin (7-chloro-7-deoxylin-
mycin), 250 and 500 mg p.o., or placebo, on
cal flora were determined in 12 adult volunteers
a double blind study. Each of the 12 volunteers
re placed on a preoperative bowel preparatory
ocedure involving 3 days of treatment with clinda-
cin or placebo, in conjunction with daily enemas
l a low residue diet. Quantitative bacteriologi-
l studies were conducted on daily stools from
h volunteer collected before and during the 3
s of treatment and for 2 days afterward. Clinda-
cin was not a suitable chemotherapeutic agent for
el antisepsis since it was not active against
iform- and enterococci-type bacteria in feces;
was, however, active against anaerobic bacteria.
fecal flora of volunteers taking placebo was
arkably constant throughout the period of study.
tary and cleansing procedures were without ef-
t on quantitative bacterial flora of volunteers.
a suggest that changes in flora per gram of
es occurring during intestinal antisepsis are
solely to the antibiotic employed. Whereas
hanical cleansing diminishes the mass of feces
consequently the total number of fecal bac-
ia, the remaining feces contains such large
bers of bacteria that their potential for infec-
n remains a major hazzard. Both mechanical
ansing and antibiotic treatment are essential
an effective 3-day bowel preparatory procedure.

5 TREATMENT OF ACQUIRED MEGACOLON BY
RETRORECTAL LOWERING OF THE COLON WITH
ERINEAL COLOSTOMY: MODIFIED DUHAMEL OPERATION.
) Haddad, J. (Fac. Med., U. Sao Paulo, Brazil).
Colon Rectum 12(6):421-429, 1969.

rorectal lowering of the colon with a temporary
ineal colostomy, a modification of the Duhamel
ration, is described. The modification increas-
patient comfort by eliminating the original
shing clamps and renders the rectocolic anasto-
is more secure. The perineal colostomy is
ected between the seventh and the fifteenth
t-operative days with an inverted "V" segment
the rectocolic septum, and the entire contour
the anastomosis is sutered with chromic catgut.
re was no leakage at the rectocolic anastomosis
50 patients with acquired megacolon in whom this
cedure was used. Partial leakage of the rectal-
mp suture line was observed in five patients,
whom the section and suture of the rectum had
made at the level or below the peritoneal re-
ction. Fecal impaction in the rectal stump oc-
red in five cases; in these patients the section
suture of rectum had been high enough to main-
a blind space between the suture and the first
ston valve; fecal impaction occurred in the
d space. To prevent leakage of the rectal-
mp suture, the section and suture must be 3 to
above the peritoneal reflection. To prevent
fecal impaction the blind space which remains between the first Houston valve and the suture of the rectal stump should be suppressed by a more invaginating second-layer suture of the stump.

0426 PERFORATED APPENDICITIS DURING INFANCY AND CHILDHOOD. *(Ger.)* Daum, R. (Surg. Clin., U. Heidelberg, Germany), W. C. Hecker and J. Tessmar. *Münchner Med Wschr* 111(43):2193-2197, 1969.

Between 1943 and 1968, perforated appendicitis was found at surgery in 585 (18.7%) of 3120 children ranging in age from 0-15 years. Subdivision into age groups revealed that perforated appendicitis accounted for 51.3% in children up to age 3, and for 15.7% in the group between 4 and 15 years of age. Perforation depended on the period for which symptoms had been present with a sharp rise in incidence between 24 and 48 hr of symptom onset, particularly in infants. Postoperative fatalities, previously due to hyperthermia and anhydremia, have been prevented during the past 5 years.

0427 PROGNOSIS IN THE IRRITABLE-BOWEL SYNDROME. A PROSPECTIVE STUDY. *(E.)* Waller, S. L. (Central Middlesex Hosp., London, England) and J. J. Misiewicz. *Lancet* II(7624):753-756, 1969.

The irritable-bowel syndrome was studied in 50 patients (30 female and 20 male) following preliminary studies to exclude organic disease. Symptoms had begun before the age of 30 in 23 of the patients. Only 7 were originally referred with the diagnosis of irritable-bowel syndrome, indicating how the syndrome may mimic other gastrointestinal diseases. Abdominal pain was present in 45 patients and mucus was found in the stools of 18. Diarrhea was the sole complaint in 5. Twenty-five patients considered their symptoms stress-related; however, anxiety, depression or other neuroses were evident in 38. During a 12-31 month follow-up (examinations at two-month intervals), symptoms remained constant in severity, but were intermittent in most patients. 'I-so-gel' seemed the most useful of several drugs. The actual follow-up was beneficial as most patients were more able to cope with their symptoms.

0428 TREATMENT OF FUNCTIONAL MEGACOLON AND MEGADOLICHOCOLON WITH DIHYDROERGOTAMINE METHANESULFONATE. *(Fr.)* Mainguet, P. (Saint-Pierre U. Hosp., Brussels, Belgium), M. Arguello and O. Thys. *Gastroent Belg* 32(7-8):534-540, 1969.

Dihydroergotamine methanesulfonate, 6 mg/day in adults and 4 mg/hr in children, was administered p.o. for 4-5 months to 14 patients with functional megacolon and 86 patients with megadolichocolon. Good results occurred in 64 patients, moderate results in 22 and poor results in 14. Dihydroergotamine methanesulfonate was more effective in patients less than 20 years of age than in adults. Mean intestinal transit regularization time generally occurred after 8 days of treatment. In 6 patients, clinical recovery (confirmed by follow-up periods of 1-6 yr) was accompanied by a reduction in the width and length of the colon. Side effects of dihydroergotamine methanesulfonate included nausea and vomiting, epigastric pain, reduction in appetite, and neurological distrubances.

0429 RELATIONSHIP OF INFECTING URINARY ORGANISM TO THE FAECAL FLORA IN PATIENTS WITH SYMPTOMATIC URINARY INFECTION. *(E.)* Grünenberg, R. N. (Edgeware Gen. Hosp., Middlesex, England). *Lancet* II(7624):766-768, 1969.

0430 THE NATURAL PUZZLE OF THE ILEOCECAL VALVE. *(E.)* Richey, D. (Barnesville Hosp., Ohio). *W Virginia Med J* 65(12):399-402, 1969.

0431 THE SURGICAL TREATMENT OF DOLICHOSIGMOID. *(Rus.)* Tsarev, I. I. (Vladivostok, USSR). *Khirurgiia* 45(10):101-105, 1969.

0432 POLYPECTOMY THROUGH A 40 CM PROCTOSCOPE. *(E.)* Fortner, J. G. (Mem. Hosp. Cancer Allied Dis., New York, N. Y.), E. J. Beattie, M. R. Deddish, R. E. L. Hertz, A. G. Huves, R. M. Ryan and A. Turnbull. *Postgrad Med* 46(5):209-213, 1969.

0433 LONG-TERM SURVIVAL AFTER LEFT LIVER LOBECTOMY. *(E.)* Ferguson, E. (Jacksonville Hosp., Florida). *Dis Colon Rectum* 12(6):444-450, 1969.

0434 PRIMARY PERINEAL HERNIA. *(E.)* Thomford, N. R. (Ohop State U. Coll. Med., Columbus) and N. J. Sherman. *Dis Colon Rectum* 12(6):441-443, 1969.

0435 TREATMENT OF CONSTIPATION IN THE AGED: EFFECTIVENESS OF MINERAL OIL AND MILK OF MAGNESIA EMULSION. *(E.)* Mulinos, M. G. (Columbia U. Coll. Phys. Surg., New York, N. Y.) and A. J. Maloney. *J Med Soc New Jersey* 66(11):619-622, 1969.

0436 TREATMENT OF THE STRICTURE OF THE COLONIC AND ANAL ANASTOMOSIS AFTER SWENSON'S OPERATION. *(Fr.)* Jaubert De Beaujeu, M. (Hosp. Debrousse, Lyon, France), P. Mollard and A. Campo-Paysaa. *Ann Chir Infant* 10(2):159-166, 1969.

0437 THE SURGICAL TREATMENT OF THE AGANGLIONIC MEGACOLON: CLINICAL CONTRIBUTION. *(It.)* Pinna, C. D. (Inst. Surg. Path. Clin., Ter., U. Rome, Italy), R. Gambarella and F. Sava. *Rass Med Sarda* 72(2):139-154, 1969.

0438 RIGHT PYELIC DILATION BY URETERAL COMPRESSION DURING AN ILEOCOLIC LOCALISATION OF CROHN'S DISEASE. *(Fr.)* Paris, J. (3 Temple Place, Lille, France), R. Delacroix, A. Dupont and J. C. Paris. *Acta Gastroent Belg* 32(9):645-651, 1969.

0439 AMOEBIC COLITIS: REVIEW OF 295 CASES. *(E.)* Lewis, E. A. (U. Coll. Hosp., Ibadan, Nigeria). *Trans Roy Soc Trop Med Hyg* 63(5):633-638, 1969.

0440 TOPICAL AMPICILLIN IN THE APPENDECTOMY WOUND: REPORT OF A DOUBLE-BLIND TRIAL. *(E.)* Rickett, J. W. S. (St. George's Hosp., London, England) and B. T. Jackson. *Brit Med J* (5677):206-207, 1969.

0441 DIAGNOSIS OF APPENDICITIS IN INFANCY: THE VALUE OF ABDOMINAL RADIOGRAPHS. *(E.)* Wilkinson, R. H. (Child. Hosp. Med. Ctr., Boston, Mass.), R. H. Bartlett and A. J. Eraklis. *Amer J Dis Child* 118(5):687-690, 1969.

0442 PERFORATED APPENDIX COMPLICATING RHESUS IMMUNIZATION IN A NEWBORN INFANT. *(E.)* Smith, A. L. (Queen Victoria Mem. Hosp., Melbourne, Australia) and R. A. MacMahon. *Med J Aust* 2(12):602-603, 1969.

0443 STUDY OF A RARE CASE OF APPENDICULAR LOCALIZATION OF BOECK'S DISEASE: HISTOPATHOGENETIC CONSIDERATIONS. *(It.)* D'Alonzo, U. (San Gerardo dei Tintori Hosp., Monza, Italy). *Chir Pat Sper* 16(5):512-523, 1968.

0444 POLYP OF THE APPENDIX. *(Ger.)* Zimmerman, G. (District Hosp., Salzburg, Germany). *Wien Med Wschr* 119(45):774, 1969.

0445 IMMEDIATE EFFECT OF OPERATIONS FOR A MALIGNANT TUMOR OF THE RECTUM: WITH REFERENCE TO 124 OBSERVATIONS. *(Fr.)* Group for study and research in Intestinal Surgery. *Arch Franc Mal Appar Dig* 58(9):74-78, 1969.

0446 SIGMOID DIVERTICULITIS AND PERIDIVERTICULITIS. *(Fr.)* Dreze, Ch. (Clin. St. Joseph, Liege, France). *Rev Med Liege* 24(20):731-732, 1969.

0447 SURGICAL TREATMENT OF CANCER OF THE RECTUM. *(Fr.)* Lavigne, J. C. (U. Liege, France). *Rev Med Liege* 24(21):766-768, 1969.

48 MALIGNANT LYMPHOMAS OF THE RECTUM: REPORT OF THREE CASES—INCLUDING A SE OF BRILL-SYMMERS DISEASE—STARTING FROM THE CTOSIGMOID LOOP. *(Fr.)* Paulet, P. (U. Hosp. St., erre, Brussels, Belgium). *Acta Gastroent Belg* (9):684-693, 1969.

49 SURGICAL TREATMENT OF RECTAL CANCER. *(Fr.)* Francillon, J. (Lyon, France), Vignal and R. Peschaud. *Arch Franc Mal Appar* g 58(9):67-72, 1969.

50 COBALT THERAPY IN RECTAL CANCER. *(Fr.)* Rousseau, J. (Paris, France), J. Cuzin, Debertrand, G. Mathieu and J. Fenton. *Arch nc Mal Appar Dig* 58(9):49-66, 1969.

51 ELECTRO-DESTRUCTION IN RECTAL CANCERS. *(Fr.)* Poiñer, A. (Angouleme, France) d J. P. Poiñer. *Arch Franc Mal Appar Dig* 58(9): -48, 1969.

52 TREATMENT OF RECTAL CANCER. *(Fr.)* Parturier-Albot, M. (Paris, France) d F. Poilleux. *Arch Franc Mal Appar Dig* 58(9): -36, 1969.

53 ARTERIOGRAPHY OF RECTAL CANCER. *(Fr.)* Rey, M. (Paris, France) and C. rnandez. *Arch Franc Mal Appar Dig* 58(9):5-15, 69.

54 RECTOSCOPIC PHOTOGRAPHIC DOCUMENTATION OF DIFFUSE MUCOSAL ALTERATIONS. *(Ger.)* ck, K. (U. Clin. Freiburg, Germany), W. Dischler, Helms and B. Kiani. *Endoscopy* 1(3):104-106, 69.

55 ABDOMINAL APOPLEXY: AN OBSERVATION OF A CASE COMPLICATING *SCHÖNLEIN-HENOCH* RPURA. *(Ger.)* Metzl, J. (2nd Surg. Clin., U. cs, Hungary), G. Boros and Z. Balogh. *Bruns itr Klin Chir* 217(6):573-576, 1969.

56 SURGICAL INTEREST IN THE MESENTERIUM COMMUNE: RARE CASE OF VOLVULUS OF THE CENDING COLON IN AN ADULT WITH MESENTERIUM COMMUNE. *t.)* Francetti, G. (Gen'l Surg. Clin., U. Milan, aly) and A. Tajana. *Arch Ital Chir* 95(1):117-126, 69.

57 DISCONTINUOUS ABSCESS OF THE SIGMOIDAL WALL. *(Fr.)* Massion, J. J. (148 Brand tlock Blvd., Brussels, Belgium) and J. Cahen. *n Hop Paris* 45(41):2555-2556, 1969.

58 A COLOSIGMOID EXTRANEOUS BODY. *(Fr.)* Grosdidier, J. (Hosp. Marin, Paris, France), R. Parietti, D. Robert and F. Watelet. *Sem Hop Paris* 45(41):2557, 1969.

0459 GIGANTIC MEGASIGMOID. *(Fr.)* Simon, G. C.(Central Hosp. Montfermeil, France). *Sem Hop Paris* 45(41):2558-2561, 1969.

0460 THE RADIOGRAMS OF THE LARGE INTESTINE AFTER PERFORMANCE OF THE SURGICAL--SWANSON-HIATT OPERATION IN THE TREATMENT OF HIRSCHSPRUNG DISEASE. *(Pol.)* Marciński, A. (Med. Acad., Warsaw, Poland). *Pol Przegl Radiol* 33(4):443-451, 1969.

0461 EXPERIENCES IN THE TREATMENT OF ACUTE DIVERTICULOSIS OF THE COLON. *(Sp.)* León Moreno, A. (no affil) and F. Torres Valadez. *Rev Sanid Milit Argent* 23(5):179-189, 1969.

0462 CANCER OF THE COLON, RECTUM AND ANUS. *(Sp.)* Mac-Kay, L. A. (Hosp. Barros Luco-Trudeau, Santiago, Chile), E. M. Cadi and M. A. Bardales Cahua. *Rev Med Valparaiso* 22(3):134-148, 1969.

0463 CANCER OF THE COLON AND RECTUM. *(Sp.)* Nestor Flores, W. (J. J. Aguirre Hosp., Santiago, Chile) and V. Roberto Marin. *Rev Med Valparaiso* 22(3):123-133, 1969.

0464 INTESTINAL OBSTRUCTION IN CANCER OF THE COLON AND RECTUM. *(Por.)* Haddad, J. (no affil, Sao Paulo, Brazil), L. S. Leonardi, O. S. Simmsen, A. H. Gama and A. Raia. *Rev Ass Med Brasil* 15(5):229-234, 1969.

0465 CANCER OF THE RECTUM: GENERAL REMARKS. *(Sp.)* Aloise, P. R. (no affil), A. N. Candioti, B. P. Ceriani and J. Christie. *Prensa Med Argent* 56(22):1082-1086, 1969.

0466 OBSERVATIONS ON OCCLUSIONS OF CARCINOMA OF THE LARGE INTESTINE. *(It.)* Brengola, G. M. (Inst. Gen'l Surg. Clin. Surg. Therap., U. Bologna, Italy) and E. Armillei. *Riv Path Clin* 23(10):805-819, 1968.

0467 A CASE OF INTESTINAL OCCLUSION DUE TO CROHN'S DISEASE, LOCATED SOLELY IN THE SIGMOID COLON. *(It.)* De Medici, A. (Dept. Clin. Surg. Therap., U. Pavia, Italy) and M. Galbussera. *Minerva Chir* 24(21):1260-1266, 1969.

0468 TWO CASES OF RECTOCOLIC MELANOSIS. *(It.)* Palmo, A. (Inst. Med. Clin. Med. Therap., U. Torino, Italy) and I. Sassi. *Minerva Med* 60(84):4171-4175, 1969.

0469 GLYCOGEN LEVELS IN TISSUE IN BENIGN OR MALIGNANT TUMORS OF THE COLON. *(It.)* Lanzini, F. Z. (Civil Hosp., Asola, Italy). *Osped Ital Chir* 20(5):393-396, 1969.

0470 CLOACOGENIC CARCINOMA DERIVED FROM AN ENTEROGENIC CYST OF THE ANORECTAL JUNCTION. *(It.)* Baruzzi, G. (Inst. Path. Anat. Hyst., U. Bologna, Italy) and R. Ferracini. *Arch Anat Istol Path* 42(5-6):474-484, 1969.

0471 CHOICE OF SURGICAL TECHNIQUE IN CASES OF GRAVE NECROGENIC TROPICAL COLITIS. *(Fr.)* Carayon, A. (Main Hosp. Dakar, French West Africa) and B. Piquard. *Bull Soc Med Afr Noire Lang Franc* 14(2):296-302, 1969.

0472 CROHN'S DISEASE OF THE COLON: WITH REFERENCE TO 40 OBSERVATIONS. *(Fr.)* De La Vaissiere, G. (Hosp. Rothschild, Paris, France), M. Favre and J. Loygue. *Actualities Hepatogastroent Hotel Dieu* 5(5):B187-B224, 1969.

0473 ARTICULAR SYMPTOMS OF HEMORRHAGIC RECTOCOLITIS AND OF CROHN'S DISEASE (ILEITIS AND COLITIS). *(Fr.)* Deshayes, P. (Clin. Med. Rouen, France), R. Colin and Y. Geffroy. *Gaz Med France* 76(26):5071-5078, 1969.

0474 A CASE OF AMEBIC GRANULOMA ASSOCIATED WITH CARCINOMA OF RECTUM. *(Jap.)* Chung, M. H. (Coll. Med., Yonsei U., Seoul, Korea), Y. J. Kim, S. Y. Chung, P. Y. Lee. *Korean J Int Med* 12(7):517-519, 1969.

0475 INFLAMMATORY GRANULOMA OF THE CECUM. *(Fr.)* Furnemont, E. (Clin. St. Anne, Brussels, Belgium). *Acta Gastroent Belg* 32(9):670-678, 1969.

0476 FAMILIAL DYSTROPHIC DWARFISM WITH HIRSCHPRUNG DISEASE. *(Fr.)* Fauchier, C. (Pediat. Ctr., Clocheville, France), J. M. Regy and P. Combe. *Ann Pediat* 45(8-9):496-502, 1969.

0477 TURISTA IN TEHERAN. TRAVELLERS' DIARRHOEA AT THE EIGHTH INTERNATIONAL CONGRESSES OF TROPICAL MEDICINE AND MALARIA. *(E.)* Kean, B. H. (Cornell U. Med. Coll., N. Y.). *Lancet* II(7620):583-586, 1969.

0478 DIVERTICULAR DISEASE OF THE COLON A DISEASE OF THIS CENTURY. *(E.)* Painter, N. S. (Manor House Hosp., London, England). *Lancet* II(7620):586-588, 1969.

0479 INVESTIGATIONS OF THE SENSITIVITY OF ISOLATED STRAINS OF SHIGELLA FLEXNERI 2a FROM MASS OUTBREAKS OF DYSENTERY TO COLICINS OF THE SHIGELLA SONNEI. *(E.)* Ogawa, T. (Nagoya City Univ. Med. Sch., Nagoya, Japan), M. Maruyama, K. Tochikubo, M. Yoshikane and T. Yamamoto. *Nagoya Med J* 15(2):73-80, 1969.

0480 RECOVERY FROM NON-TRAUMATIC LOCALISED GAS GANGRENE AND CLOSTRIDIAL SEPTICAEMIA. *(E.)* Marty, A. T. (Peter Bent Brigham Hosp., Boston, Mass.) and R. M. Filler. *Lancet* II (7611):79-81, 1969.

0481 THE SURGICAL TREATMENT OF RECTAL PROCIDENTIA. *(E.)* Frykman, H. M. (Minneapolis, Minn.) and S. M. Goldberg. *Surg Gynec Obstet* 129(6):1225-1230, 1969.

0482 A COMPARATIVE STUDY OF ACUTE APPENDICITIS IN CHILDREN AND ADULTS OVER A TEN YEAR PERIOD AT THE AMERICAN UNIVERSITY HOSPITAL. *(E.)* Dagher, F. J. (American U. Hosp., Beirut, Lebanon), M. S. Slim and A. M. Panossian. *J Med Liban* 21(3):113-123, 1968.

0483 ASSOCIATION OF APPENDICITIS WITH INFECTIVE HEPATITIS. *(E.)* Clendinnen, B. G. (United Birmingham Hosp., Birmingham, England) and J. A. Williams. *Lancet* II(7614):242-243, 1969.

0484 MULTIPLE OSTEOMAS OF THE MANDIBLE ASSOCIATED WITH POLYPOSIS OF THE COLON (GARDNER'S SYNDROME). *(E.)* Neal, C. J., Jr. (Columbus State Inst. Clin., Columbus, Ohio). *Oral Surg* 28(5):628-631, 1969.

0485 REVIEW OF LITERATURE ON DISEASES OF THE COLON AND RECTUM: MAY-JUNE 1968. *(E.)* Rowe, R. J. (Dallas, Texas) and E. Reinmiller. *Dis Colon Rectum* 12(6):472-479, 1969.

0486 PATTERNS OF COLONIC DISORDERS IN IRAN. *(E.)* Ghavami, A. (Pahlavi U. Sch. Med., Shiraz, Iran) and F. Saidi. *Dis Colon Rectum* 12(6):462-466, 1969.

0487 PRIMARY ADENOCARCINOMA OF THE APPENDIX. *(E.)* Pugeda, F. V. (Williamson, W. Va.), and J. R. Hinshaw. *Dis Colon Rectum* 12(6):457-461, 1969.

0488 FREE PERFORATION IN SIGMOID DIVERTICULITIS: TWO-STAGE THERAPY. *(E.)* Reiss, R. (Tel Aviv U. Med. Sch., Meir Hosp., Kjar Saba, Israel). *Dis Colon Rectum* 12(6):453-456, 1969.

0489 DIVERTICULITIS—A CASE REFLECTING UPON PATHOGENESIS. *(E.)* McCarthy, J. D. (Lovelace Clin., Lovelace Foundation for Med. Ed.

s., Albequerque, N. M.) and J. G. Picazo. *Dis lon Rectum* 12(6):451-452, 1969.

0 NECROTIZING ANORECTAL LESIONS ASSOCIATED WITH *PSEUDMONAS* INFECTION IN LEU-
IA. *(E.)* Gilver, R. L. (Dept. Path., U. Iowa,
a City). *Dis Colon Rectum* 12(6):438-440, 1969.

1 VOLVULUS OF THE COLON. *(E.)* Ponka, J.
(Henry Ford Hosp., Detroit, Mich.). *Dis Colon
tum* 12(6):430-437, 1969.

2 A TRANSRECTAL APPROACH TO THE HIGH-LYING LESION IN THE RECTOSIGMOID. *(E.)* Schultz, P. E. (Ferguson-Droste-Ferguson Hosp., Grand Rapids, Mich.). *Dis Colon Rectum* 12(6):417-420, 1969.

0493 AN EVALUATION OF THE AMEBICIDAL PROPERTIES OF METRONIDAZOLE. *(E.)* Minvielle, L. (Mexico City, Mexico), A. Elorriaga, C. Castellanos and M. Heiblum. *Dis Colon Rectum* 12(6):412-416, 1969.

0494 THE PHARMACOLOGY OF COLONIC MUSCLE. *(E.)* Fishlock, J. D. (London Hosp. Med Coll., London, England). *J Roy Coll Surg Edinb* 14(5):271-274, 1969.

See also: 0179,0187,0188,0199 (Diagproc) • 0237 (D:Esoph) • 0331 (D:Stomduo) • 0357, 0365,0374,0376,0382,0391,0393,0394,0395 (D:S.Intest) • 0495,0497 (D:L.Intest:Ulccol) • 0512 (D:Pancreas:Pancreat) • 0567 (D:Livbil) • 0687,0689,0690 (D:Gen)

0495 FURTHER STUDIES OF THE KINETICS OF RECTAL EPITHELIUM IN NORMAL SUBJECTS AND PATIENTS WITH ULCERATIVE OR GRANULOMATOUS COLITIS. *(E.)* Spencer, R. J. (Mayo Clin., Rochester, Minn.), K. A. Huizenga, C. S. Hammer and R. G. Shorter. *Dis Colon Rectum* 12(6)406-408, 1969.

Biopsy samples were obtained at proctoscopic examination from 6 normal subjects (4 men and 2 women). Samples of nonulcerated rectal mucosa were also taken from 6 patients (5 men and 1 woman) with active chronic ulcerative colitis, 10 (4 men and 6 women) with inactive chronic ulcerative colitis and 6 (4 men and 2 women) with clinically active granulomatous colitis involving the rectum. Counts were made of the number of crypts in each specimen, the total number of epithelial cells in each crypt, and total number of cells in each crypt in all mitotic phases. The renewal time for each specimen was calculated from the mitotic index (assuming a mitotic duration of 1 hr). In all specimens from each group, mitotic figures were seen only in the basal two thirds of the crypts. The mean renewal time for the rectal epithelium of the normal subjects was 2.44±0.27 days; that of the patients with chronic granulomatous colitis, active chronic ulcerative colitis, and inactive chronic ulcerative colitis were 2.98±0.6 days, 7.38±1.71 days, and 2.46±0.41 days resp.

0496 PSEUDOPOLYPOSIS IN ULCERATIVE COLITIS. *(E.)* Jalan, K.N. (Western Gen. Hosp., Edinburgh, Scotland), W. Sircus, R.J. Walker, J.P.A. McManus, R.J. Prescott and W.I. Card. *Lancet* II(7620):555-559, 1969.

The clinical significance of pseudopolyposis in ulcerative colitis was examined in a retrospective analysis of 399 patients. Radiologically or pathologically diagnosed pseudopolyposis occurred in 75 patients. The incidence was not sex related and decreased with increasing age. The length of history of ulcerative colitis did not appear to influence the incidence. Pseudopolyposis was more likely to occur in patients with severe and extensive disease. There was a positive association between toxic dilation and the presence of pseudopolyposis. No such relation could be demonstrated for hemorrhage, perforation, or colonic stricture. A positive association was also shown between arthropathy and pseudopolyosis. The outcome of severe attacks of ulcerative colitis in the presence of pseudopolyps was found to be more favorable. Surgical survival-rate was 95% in the presence and 56% in the absence of pseudopolyps. Pseudopolyposis appears to be irreversible.

0497 ULCERATIVE COLITIS AND CARCINOMA OF THE COLON. *(E.)* Brooke, B. N. (St. George's Hosp., London, England). *J Roy Coll Surg Edinb* 14 (5):274-278, 1969.

The relation between ulcerative colitis and carcinoma of the colon was discussed following observations on 35 patients with ulcerative colitis who developed cancer. The mean duration before the development of cancer was about 15 yr. The age of onset of colitis did not appear to affect the duration before cancer development. The average age of onset of cancer was 47 as compared with 67 for the general population. Of the 35 cases only 16 were operable with the hope of cure. There were ten 5 yr survivors among the 35 (32%). In 5 of the survivors, the growth was not demonstrable by the usual clinical or radiological means. Because cancer cannot be revealed with certainty at a curable stage, total excision of the large bowel is advisable in patients with the disease of 10 yr duration.

0498 MORTALITY IN ULCERATIVE COLITIS: 1930 T 1966. *(E.)* Morowitz, D. A. (Dept. Med., U. Chicago, Ill.) and J. B. Kirsner. *Gastroenterology* 57(5):481-490, 1969.

Causes of death were investigated in 137 ulcerativ colitis patients dying between 1930 and 1966. Forty-six patients, averaging 39 years of age, die of causes directly attibutable to ulcerative colitis; these included colonic perforation, operative and postoperative deaths, and fulminating disease. The 46 colitis-related deaths were caused by carcinoma of the colon and rectum, chronic liver disease, suicide, phlebothrombosis, and complications of medical therapy. Deaths in 45 patients were unrelated to ulcerative colitis or any of its known complications. Review of the latest barium enema in 125 of the patients under study disclosed a significant correlation between the presence of severely involved colons and direct colitis and colitis-related deaths. The patterns of mortality over the period under study indicate that both the survival times in ulcerative colitis and the ages at death are increasing. Likewise, the major caus of death are changing. There is a decline in the frequency of deaths directly due to ulcerative colitis and a corresponding increase in both colitis-related and colitis-unrelated deaths. The high over-all proportion (2 of 3) of those patient dying because of factors directly or indirectly related to their bowel disease emphasizes the continuing therapeutic challenge presented by ulcerative colitis.

0499 DYSPHAGIA AND ULCERATIVE COLITIS. *(E.)* Alea, J. A. (VA Hosp. State U. New York, Buffalo, Sch. Med. *Gastroint Endosc* 16(2):111-11 1969.

0 HEMOPHILUS INFLUENZAE IN CYSTIC FIBROSIS. *(E.)* Kilbourn, J. P. (Med. Sch. Hosp., Oregon, Portland. *Lancet* II(7617):439, 1969.

ntitative cultures were obtained over a 3 yr iod from the sputa of cystic fibrosis patients. n *H. influenzae* was isolated, the logarithmic ber of organisms per ml of sputum was noted and atellite test was performed to distinguish the anism from *H. parainfluenza.* Antibody staining performed to determine fluorescence with fluorent antibody Type b. The organisms were examd for encapsulation and antibiotic sensitivity. ween January and March, significantly more *influenza* per ml sputum fluoresced to fluorest antibody Type b than did not fluoresce; more ients with the organisms also showed the same ults. In June, the opposite was true. In ober, there were significantly more *H. influenza* ml sputum which fluoresced, but there were also e patients with the organism which did not oresce. Although they do not have a capsule, se organisms which fluoresce to fluorescent ibody Type b may have an important role in tic fibrosis.

1 CARCINOMA OF THE PANCREAS. *(Cz.)* Oskera, J. (Pisek, Czechoslovakia) and V. Dverak. *Gastroent Vyz* 23(6):291-296, 1969.

2 ON A CASE OF HYPOGLYCEMIC EXTRAPANCREATIC TUMOR. *(It.)* Sensi, S. (Inst. Gen. Med. rap., Catholic U., Rome, Italy), F. Capani and . Pizzolato. *Gaz Sanit* 40(6):258-260, 1969.

3 MASSIVE DIGESTIVE HEMORRHAGE DUE TO EROSION OF THE GASTRODUODENAL ARTERY IN EUDOCYST OF THE PANCREAS. *(Fr.)* Van Kemmel, M. y Hosp., Lille, France). *Sem Hop Paris* 45(41): -2566, 1969.

0504 TREATMENT OF PSEUDOCYSTS OF THE PANCREAS: A RESUME CONCERNED WITH 44 SURGICAL CASES. *(Fr.)* Adloff, M. (Surg. Clin. B. Strasbourg, France) and J. J. Kohler. *Praxis* 58(44):1404-1412, 1969.

0505 ARTERIOGRAPHIC INDICATIONS OF PANCREATIC DISEASES. *(Fr.)* Hernandez, C. (Hosp. Bichat, Paris, France) and V. Bismuth. *Gaz Med France* 76(27):5271-5290, 1969.

0506 SURGERY OF THE PANCREAS. *(Fr.)* Clot, J. P. (Hosp. Pitie, Paris, France). *Gaz Med France* 76(27):5323-5335, 1969.

0507 EXTERNAL PANCREATIC INSUFFICIENCIES IN THE INFANT. *(Fr.)* Labrune, B. (Hosp. Dis. Child., Paris, France). *Gaz Med France* 76(27):5307-5314, 1969.

0508 PANCREATODUODENECTOMY IN A CASE OF PANCREATIC FISTULA. *(Pol.)* Myszka, S. (Miejski Hosp., Torun, Poland), T. Nowicki and W. Jedrzejczyk. *Pol Przegl Chir* 41(9):1322-1324, 1969.

0509 THE VAS DEFERENS IN CYSTIC FIBROSIS. *(E.)* Valman, H. B. (Queen Elizabeth Hosp. Child., London, England) and N. E. France. *Lancet* II (7620):566-567, 1969.

0510 PANCREATIC TRANSPLANT: SURGICAL TECHNIQUE AND SOME CLINICAL OBSERVATIONS. *(Sp.)* Bortogaray, M. C. (no affil), B. Numisovich, R. Lori, J. Viaggio, J. F. Zelazco, G. Crouzei, E. Cassin, A. Bava, E. Mathov, J. R. Justo, N. Maquiera and P. Baum. *Prensa Med Argent* 56(17):767-768, 1969.

See also: 0297,0320,0323,0335 (D:Stomduo) • 0375,0377 (D:S.Intest) • 0563 (D:Livbil) • 0634 (D:Livbil:Cirrh) • 0691 (D:Gen)

0511 SPLENIC COMPLICATIONS OF CHRONIC PANCREATITIS: FIVE CASE REPORTS. *(Fr.)* Moreaux, J. (no affil) and H. Bismuth. *Presse Med* 77(42): 1467-1470, 1969.

The splenic complications of chronic pancreatitis which coincide with acute attacks of pancreatitis or pancreatic pseudocysts differ in their clinical manifestation and pose difficult diagnostic problems. Reports of 5 complications included a rare case of splenic rupture and 2 cases each of splenic necroses and intrasplenic blood-filled pseudocysts. The major complication, splenic rupture was caused by a voluminous hematoma in the left hypochondrium that resulted in laceration of the capsule at the anterior splenic surface. The two cases of splenic necroses were associated with diffuse perisplenic hematoma, pleural effusion, anemia, pain and swelling in the left hypochondrium. The two intrasplenic pseudocysts detected by celiac trunk arteriography were associated with severe attacks of pancreatitis. Little is known of the etiology of these lesions. Mechanical causes including trauma, pancreatic induration and peritoneal adhesions, and action of enzymes such as elastase and alpha-chymotrypsin have been implicated in the etiology of these splenic complications.

0512 PARTICIPATION OF THE LEFT COLON IN THE DEVELOPMENT OF PANCREATITIS. *(It.)* Bocus, G. (United Civil Hosp., Venice, Italy) and G. Busetto. *Vene Sci Med* 23(9-10):523-534, 1968.

0513 EARLY LAPAROTOMY IN ACUTE PANCREATITIS. *(Pol.)* Ziarek, S. (Med. Acad. Zabrze, Poland), H. Morawiec, J. Puzio and M. Sikora. *Pol Przegl Chir* 41(10):1343-1348, 1969.

0514 THE SECRETORY FUNCTION OF THE PANCREAS IN CHRONIC PANCREATITIS STUDIED BY THE SECRETIN-PANCREOZYMIN TEST. *(Sp.)* Valenzuela, J. (Dept. Med., U. Chile, Santiago), M. Peterman, A. Csendes and F. Lorca. *Rev Med Chile* 97(5):290-294, 1969.

0515 DIABETIC LIPEMIA COMPLICATING ACUTE PANCREATITIS. *(E.)* Bagdade, J. (U. Washington Sch. Med. and V.A. Hosp., Seattle). *Lancet* II(7629):1041-1043, 1969.

0516 HYPERPHOSPHATURIA IN ACUTE PANCREATITIS. *(E.)* Bernacki, E. (Med. Acad., Bialystok, Poland). *Pol Med Sci History* 12(4):176-179, 1969.

0517 BEHAVIOR OF ELASTASE, AND ANTIELASTASE AND OF THE 5TH ENZYMIC FRACTION IN PATIENTS WITH CHRONIC PANCREATITIS. *(Rum.)* Surianu, P. (Med. Clin., Cluj, Rumania), S. Tragor and A. Lenghel. *Stud Cercet Med Intern* 10(5):439-443, 1969.

0518 ENZYME SUBSTITUTION IN CHRONIC PANCREATITIS *(Ger.)* Papp, J. (U. Polyclin. Med., Zurich, Switzerland). *Praxis* 58(44):1428-1431, 1969.

0519 ATTEMPT AT A SYSTEMIZATION OF THE PATHOLOGY OF ACUTE PANCREATITIS. *(Fr.)* Buligesco, L. (Hosp. Fundeni, Bucarest, Rumania). *Acta Gastroent Belg* 32(9):636-644, 1969.

0520 CHRONIC PANCREATITIS: INDICATIONS, DEVELOPMENT, MEDICAL TREATMENT. *(Fr.)* Gouin, B. (Hosp. Bichat, Paris, France). *Gaz Med France* 76(27):5255-5269, 1969.

0521 MEDICAL TREATMENT OF ACUTE PANCREATITIS. *(Fr.)* Barbier, J.P. (Hosp. Laennec, Paris, France). *Gaz Med France* 76(27):5343-5347, 1969.

0522 ANATOMICAL CHARACTERISTICS AND THE PHYSIOPATHOLOGIC CLASSIFICATION OF CHRONIC PANCREATITIS. *(Fr.)* Martin, E.D. (no affil). *Bull Soc Chir Paris* 59(3):129-140, 1969.

0523 ON A CASE OF MUCOVISCIDOSIS WITH AN UNUSUAL COURSE. *(It.)* Cavazzuti, G.B. (Inst. Pediat. Clin., U. Moderna, Italy) and G. Caramia. *Clin Pediat* 51(3):131-141, 1969.

0524 MUCOVISCIDOSIS. *(It.)* Madon, E. (Pediat Clin., U. Turin, Italy) and L. Benso. *Aggior Clin Ter* 10(4):1-49, 1969.

0525 PROPHYLAXIS FOR ACUTE PANCREATITIS FOLLOWING A SECOND OPERATION FOR A BIOPSY OF THE PANCREAS. *(Sp.)* Figueroa, E. (Expresident de Legiao Med. Sao Lucas, Cordoba, Argentina). *An Paultistas Med Chir* 96(4):239-252, 1969.

0526 VALUE OF THE DETERMINATION OF THE PLASMA DESOXYRIBONUCLEASE IN THE DIAGNOSIS OF EXPERIMENTAL ACUTE PANCREATITIS. *(It.)* Finocchio, F. (Inst. Gen'l Surg. Clin. Surg. Therap., U. Catania, Italy), P. Azzolina, S. Arcerito, N. Cannava, S. Bonfiglio and P. Banna. *Chir Pat Sper* 16(5):1-19, 1968.

527 PLEURISY, AN EARLY SYMPTOM OF PANCREATITIS: (DESCRIPTION OF ONE CASE.) *(It.)* Tonietto, (Civ. Hosp., Castelfranco Veneto, Italy), G. naldi and P. Baiocchi. *Chir Pat Sper* 16(5):Supp.: 39-147, 1969.

0528 DIAMETER OF THE PANCREATIC DUCT LUMEN UNDER PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS. *(Pol.)* Aleksandrowicz, R. (Acad. Med., Warsaw, Poland) and Z. Daciewicz. *Acta Biol Med* 13(2):233-238, 1968.

See also: 0086 (P:Secr:Panc) • 0193,0196,0198,0208 (Diagproc) • 0276,0306 (D:Stomduo)

0529 MORPHOLOGICAL STUDIES OF THE LIVER AFTER CRYOSURGERY.

(Ger.) Stucke, K. (Surg. Clin., U. Würzburg, Germany) and F. Kahlert. *Acta Hepatosplen* 16(5):311-324, 1969.

Cryosurgery of the liver was performed in 50 rabbits to determine the extent of injury produced by local freezing, to observe the effect of freezing on parenchymal bleeding following resections and ruptures, and to compare cryosurgery with local electrocoagulation. After thawing, edematous lesions were seen macroscopically and coagulation necroses were found microscopically. Demarcation and repair in the form of leukocyte infiltration and connective tissue and bile duct proliferation set in while the lesions were still in the stage of degeneration. Healing proceeded promptly and 8 weeks after freezing parenchymal damage was no longer visible. The hemostatic effect of the cryo-method was distinct, there was no diffuse parenchymatous bleeding and hemorrhages from larger vessels could be terminated by ligature. The zones of slough were reduced to a minimum by combined use of freezing and electrocoagulation. Cryosurgery may be useful in destruction of malignant tumors in human subjects.

0530 BORDERLINE BETWEEN GILBERT'S DISEASE AND HEPATITIS-INDUCED HYPERBILIRUBINEMIA.

(It.) Gentilini, P. (Inst. Spec. Med. Pathol., U. Florence, Italy), C. Surrenti, A. Candidi-Tommasi, R. Camilloni and L. Narcetti. *Rass. Fisiopatol Clin* 41(3):273-331, 1969.

Fifteen patients with Gilbert's disease including 2 cases of particularly high unconjugated bilirubinemia (type Arias) were compared with 9 patients with indirect, hepatitis-induced hyperbilirubinemia and 6 normal controls to differentiate between the 2 syndromes and their pathogenetic mechanisms. In addition to normal routine tests, the following were carried out: function tests capable of revealing red cell defects including ^{51}Cr-labeled red cell survival, bone marrow biopsy, autohemolysis test; BSP and bilirubin loading tests and relative clearances; light and electron microscopy of biopsy specimen. Taken by themselves, none of the parameters clearly distinguished between the two diseases but provided the following diagnostic clues when considered in combination: For Gilbert's disease, these characteristics included frequent familial distribution; marked changes in bilirubin loading; ultrastructural changes in the Disse space and at the sinusoidal boundary of the liver cell indicating a deficient bilirubin uptake by the liver cell; deficiency in glucuronyl transferase activity was noted only in the 2 cases of particularly high bilirubinemia. With respect to hepatitis-induced hyperbilirubinemia, the bilirubin loading test showed a simialr uptake defect; increase in collagen fibrils in the Disse space and loss of microvilli from the bile canaliculi was observed by electron microscopy; finally there was well compensated increased hemolysis with shortened red cell survival.

0531 DISTURBED HAIR GROWTH AT THE SCALP AS A CONSEQUENCE OF HEPATIC DISEASES.

(Ger.) Zaun, H. (Dermatol. Clin., Saarland U., Hamburg, Germany), D. Mütig and I. Steinmann. *Arch Klin Exp Derm* 235(4):386-393, 1969.

Hair root patterns (trichograms) were determined in the parietal region of the scalp of 53 patients with hepatitis, cirrhosis or fatty degeneration of the liver. Increased percentages of telogen and/or dystrophic hair roots indicating disturbed hair growth were demonstrated in 34 instances (64%). Distinct hair loss following liver disease was reported by 11 patients. Disturbances in amino acid metabolism and insufficient inactivation of estrogens that may be associated with liver damage are cited as possible causes of hair loss.

0532 CLOTTING ABNORMALITIES INCLUDING INTRAVASCULAR CLOTTING FOLLOWING TRANSPLANTATION OF PRESERVED LIVERS IN PIGS.

(E.) Wasantapruek, S. (U. Colorado Sch. Med., Denver), J. Homatas, K. N. von Kaulla and B. Eiseman. *Thromb Diath Haemorrh* Suppl 36:319-332, 1969.

Studies were performed in pigs to define the factors affecting coagulation following orthotopic transplantation of marginally preserved livers. Livers were perfused in several ways and were transplanted 6-24 hr after excision. Because heparin (300U/kg) and epsilon-amino-caproic acid (EACA) were administered to the animals before transplantation, euglobulin lysis time was used to measure plasminogen activity and fibrinolysis. Insertion of the livers as homografts resulted in reduction of euglobulin lysis time in direct proportion to duration of preservation. Despite EACA treatment, all the animals experienced delayed hemorrhage. There was a marked decrease in fibrinogen during transplantation followed by a less pronounced decrease after revascularization, the degree of depression paralleling duration of preservation. The platelet pattern was depressed in an essentially identical manner as that of fibrinogen. In another series of experiments, 24 hr preserved livers were inserted as auxiliary (heterotopic) transplants in 10 animals, with resultant clotting defects similar to those observed with orthotopic transplants. The data from hepatic outflow of the auxiliary liver and from the systemic circulation indicated that both fibrinogen and platelets were reduced as they circulated through the auxiliary liver. Attempts to localize the source and to define the nature of the heparin-like substance were inconclusive.

0533 EFFECT OF INDUCED METABOLIC ALKALOSIS IN HEPATIC ENCEPHALOPATHY.

(E.) James, I. M. (Roy. Free Hosp., London, England), S. Nashat, D. Sampson, H. S. Williams and M. Garassini. *Lancet II* (7630):1106-1108, 1969.

Five patients in deep hepatic coma and 5 with severe portosystemic encephalopathy were given 500 ml of 5% sodium bicarbonate over a 1/2 hr infusion period. Cerebral blood-flow was measured

the Veall inhalation technique. Arterial samples
re drawn from the femoral artery and venous samples
om the jugular bulb. A striking improvement in
mptomatology was noted in 3 of the patients in
patic coma; in contrast, no noticeable improve-
nt was detected in those with portosystemic
cephalopathy. Slight but definite improvement
curred in 2/3 comatose patients in whom electro-
cephalographic monitoring was performed. In
th groups, there was a marked increase in cerebral
ood-flow and in cerebral oxygen consumption, as
ll as a fall in cerebral glucose requirements
llowing the bicarbonate infusion. The extremely
w oxygen/glucose index seen initially in the
matose patients rose to about 75% normal follow-
g infusion; the changes were not so striking in
e patients with portosystemic encephalopathy.

34 LIVER FUNCTIONS IN BILHARZIAL FEMALES.

(E.) Nazli Gad-el-Ma la, A. A. (Res.
st., Cairo, United Arab Republic). *Hepatosplen*
(5):308-310, 1969.

ver function tests were performed on 28 women
)-35 yr) who had a past history of intestinal
lharziasis and who had received contraceptive
lls (2.5 and 5 mg Lyndiol) for periods of 6
nths - 5 yr. Nine patients had enlargement of
e liver and spleen, 3 had enlargement of the
leen, and 5 had enlargement of the liver. There
s no jaundice, ascites or edema of the lower
mbs. Liver function tests on the patients showed
e following results: serum bilirubin, 0.3-0.53;
nc sulfate, 3-6; thymol turbidity 2-4; SGPT,
-32; SGOT, 22-36; alkaline phosphatase, 5.4-6.8.
e values did not differ significantly from those
15 controls. Contraceptive pills have no dele-
rious effect on liver function even in the presence
bilharzial hepatic involvement.

5 PARADOXICAL ELEVATION OF GROWTH HORMONE IN ACTIVE CHRONIC HEPATITIS.

(E.) Becker,
D. (Roy. Free Hosp., London, England), G. C.
k and A. D. Wright. *Lancet* II(7629:1035-1039,
9.

interrelation of glucose, growth hormone and
ulin was investigated in 14 patients (12 female)
h active chronic hepatitis of varying severity
4 normal controls. Half of the patients were
ceiving 10-30 mg prednisolone daily. Oral glu-
e (0.75 g/kg) and i.v. glucose (0.5 g/kg) tol-
nce tests were performed; glucose tolerance was
appreciably affected by the degree of activity
the disease or by corticosteroid therapy. The
ponse of growth hormone to both routes of glu-
e administration was abnormal in 8 of the
ients. Paradoxical growth hormone elevations
e found in 3/4 advanced cases, 3/5 moderate
es, and only 1 early case with i.v. glucose;
4 advanced and 2 moderate cases showed the
adoxical elevation following p.o. administration.
mean concentration of growth in the corticoster-
and untreated groups were similar but higher than in the control group after both routes of glucose administration. Growth hormone levels did not rise appreciably during 30 min saline infusion in either of 2 patients tested or in the control. The mean concentration of insulin was higher in the patients (particularly the corticosteroid treated) than the controls following both routes of glucose administration. Possible causes of growth hormone elevation are a decreased degradation-rate of the hormone, hypoproteinemia, and hyperestrogenemia; however, none of these explanations seem satisfactory.

0536 AUSTRALIA ANTIGEN IN ACUTE AND CHRONIC LIVER DISEASE.

(E.) McCollum, R. W. (Yale U. Sch. Med., New Haven, Conn.), R. Wright and G. Klatskin. *Lancet* II(7612):117-121, 1969.

The sera of 389 patients with a wide variety of biopsy-documented acute and chronic liver disease and of 135 healthy controls were tested for the presence of Australia (Au) antigen by a modification of the micro-Ouchterlony double-diffusion technique. Serum samples containing high 'titers of anti-Au antibodies were obtained from subjects who had been exposed to patients with viral hepatitis but never had the disease. These anti-Au sera, when tested against reference sera containing Au antigen gave reactions of identity with human and rabbit anti-Au sera and anti-SH serum. Au antigen was detected in the serum of 46/88 (52%) patients with acute viral hepatitis, 11/29 (38%) with prolonged viral hepatitis, and 6/24 (25%) with chronic active hepatitis, but not in 135 controls and in only 3 of the remaining 248 patients with other forms of acute and chronic liver disease. In each of the latter 3 cases, Au antigen was detected in the serum a few days after multiple transfusions of whole blood. In viral hepatitis, Au antigen occurred most frequently in infections of unknown type (67%), less commonly in serum hepatitis infections (49%), and least commonly in infectious hepatitis infections (25%). Data confirm previous reports that Au antigen can be detected in serum of a high proportion of patients with acute viral hepatitis, and demonstrate that, in prolonged viral hepatitis, the antigen may persist for months or years, disappearing only after the disease becomes inactive.

0537 FOLLOW-UP STUDIES OF CEBUS APELLA EXPOSED TO HEAVY INFECTIONS WITH SCHISTOSOMA MANSONI.

(E.) da Silva, L. C. (U. Sao Paulo, Brazil), T. de Brito, J. Gunji, A. L. Ceravolo, S. Hoshino Shimizu, J. D. Lopes and L. M. Souza. *Rev Inst Med Trop Sao Paulo* 11(5):309-318, 1969.

Capuchin monkeys (Cebus apella), both intact and splenectomized, were exposed to Schistosoma (S.) mansoni infection by placing 200-700 cercariae on the abdominal area for 45 min. Challenge doses were given at monthly intervals. After a prepatent period of 43-50 days, infected monkeys passed viable eggs (proven by hatching technique) with micracidia infective for snails throughout the period of experimental infection. Egg production was highest between the 3rd and 5th month after infection. Splenoportography and intrasplenic pressure were not altered by S. mansoni infection in intact monkeys. Death due to S. mansoni infection occurred in 4 monkeys.

0538 ENZYME HISTOCHEMICAL STUDY OF PRIMARY HEPATIC CARCINOMA IN THAILAND. *(E.)* Stitnimankarn, T. (Fac. Med., Mahidol U., Bangkok, Thailand) and K. Thakerngpolo. *Cancer* 24(5):1064-1067, 1969.

A histochemical study of the activities of hydrolytic and oxidative enzymes was made on 29 surgical biopsies and 15 postmortem specimens of primary hepatic carcinoma. Alkaline phosphatase activity could not be demonstrated in tumor tissue from any of the 44 cases studied. Lactase, isocitric dehydrogenases, and DPNH-diaphorase activities were increased in a majority of the tumors as compared with nontumorous parenchyma. Activities of glucose-6-phosphate, glutamate, beta-hydroxybutyric and 6-phosphogluconate dehydrogenases were greater in liver tissue than in tumor nodules. This difference was especially true for the last 2 enzymes. Dihydro-orotate dehydrogenase and TPNH-diaphorase gave variable results. Similar results were obtained in both surgical biopsy and postmorten specimens. The presence or absence of cirrhosis did not alter enzyme activities. Enzymatic activities of carcinomas of the liver were not related to morphological grade of differentiation.

0539 PHENOBARBITONE THERAPY IN NEONATAL HYPERBILIRUBINAEMIA. *(E.)* Yeung, C. Y. (Dept. Pediat., U. Hong Kong) and C. E. Field. *Lancet II* (7612):135-139, 1969.

The effect of phenobarbital on neonatal jaundice was tested in 210 moderately jaundiced (serum-bilirubin 10-20 mg/100ml) newborn Chinese babies. Phenobarbital syrup was administered p.o. for 2-7 days or until serum-bilirubin fell below 10 mg/100ml. At 8 hr intervals, 5 mg of the drug was administered to normal-weight babies and 2 mg/kg was administered to those under 2.5 kg. Of 117 controls, 53 required exchange transfusions; 4 of 93 treated babies required an exchange, all within 24 hr of drug initiation. One of 22 treated cases and 17 of 25 controls with ABO incompatibility required an exchange. Exchange transfusions were required in 1 of 9 treated and 8 of 16 controls with glucose-6-phosphate dehydrogenase deficiency. Statistically significant reduction of bilirubin levels was also achieved by phenobarbital therapy in those babies with cephalhematoma and hyperbilirubinemia of non-specific cause.

0540 EFFECT OF PHENOBARBITONE AND PRE-ECLAMPTIC TOXEMIA ON NEONATAL JAUNDICE. *(E.)* Powell, J. (Dept. Soc. Med., U. Birmingham, England), J. Waterhouse, P. Cutley and B. Wood. *Lancet* II(7624):802, 1969.

0541 LACK OF INHIBITION OF HEPATIC CHOLESTEROL SYNTHESIS BY DIETARY CHOLESTEROL IN CASES OF FAMILIAL HYPERCHOLESTEROLEMIA. *(E.)* Khachadurian, A. K. (American U. Beirut, Lebanon). *Lancet* II(7624) 778-780, 1969.

0542 HEPATIC COMA IN PREGNANCY. *(E.)* Lindall, A. W. (Hennepin County Gen. Hosp., Minneapolis, Minn.), D. Mason and A. L. Schultz. *Minn Med* 52(11):1737-1739, 1969.

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0547 VIRAL HEPATITIS, POSTNECROTIC CIRRHOSIS, AND HEPATOCELLULAR CARCINOMA. *(E.)* Smith, J. B. (Inst. Cancer Res., Philadelphia, Pa.) and B. S. Blumberg. *Lancet* II(7627):953, 1969.

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0549 THE GEOGRAPHICAL PATHOLOGY OF LIVER DISEASE IN MAN. *(E.)* Higginson, J. (Int. Agcy. Res. Cancer, Lyon, France). *Gastroenterology* 57(5):587-598, 1969.

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CATECHOLAMINE POTENTIATION OF CARBON
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on tetrachloride (CCl_4)-induced hepatonecrosis,
sured by changes in serum glutamic pyruvic
saminase (SGPT) activity, was potentiated by
ltaneous s.c. administration of low doses
1-0.02 ml/kg) of epinephrine or norepinephrine.
required for SGPT levels to return to normal
not affected by epinephrine or norepinephrine.
lts of histopathologic evaluation of the
ges in liver of mice used in SGPT experiments
limented the results of the SGPT activity ex-
ments. Epinephrine and norepinephrine did
potentiate the CCl_4-induced accumulation of
lycerides in the liver.

EXPERIMENTAL STUDIES ON THE METABOLISM
OF VARIOUS ANTIBIOTICS IN HEPATIC DYS-
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rption and metabolism of penicillin-G, oxa-
in, streptomycin, tetracycline and chloram-
icol were studied in control rabbits and rats
those with hepatic dysfunction induced by
er carbon tetrachloride (CCl_4) administration
y ligation of the common bile duct. In paral-
with the in vivo study, the inactivation of
antibiotics by liver slices from these animals
also studied in vitro. Blood levels of peni-
in-G were of longer duration in animals with
rs damaged by either CCl_4 or ligation than in
rol animals. Inactivation of antibiotics was
eased in liver slices from animals treated
CCl_4. In vitro inactivation of oxacillin was
same in liver slices from CCl_4-treated and
rol animals. Blood levels of oxacillin,
owing i.v. administration, were increased in
als with hepatic damage caused by ligation of
common bile duct. However, blood levels of
illin in animals with livers damaged by CCl_4
similar to those in control animals, suggest-
that oxacillin is metabolized differently than
cillin-G. Inactivation of streptomycin was
decreased following incubation with liver
es in vitro. Absorption and excretion of
ptomycin, following i.v. administration, was
lar in control animals and those with hepatic
ge caused by either ligation or CCl_4. Blood
ls of tetracyline, following i.v. administra-
, were of longer duration in animals with he-
c dysfunction than in control animals. In-
vation of chloramphenicol was greater in liver
es from control animals than in those from
-treated animals. Blood levels of chloram-
icol, following i.v. administration, were of
edly longer duration in animals with hepatic
unction than in control animals. Data indi-
that the metabolism of penicillin-G tetracy-
and chloramphenicol are markedly affected
iver cell damage and occlusion of the common
bile duct, and that the metabolism of oxacillin is affected only by occlusion of the common bile duct.

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PROGNOSIS OF CHRONIC HEPATITIS: I. DISEASE FORMS AND STAGES OF EVOLUTION. .) Vido, I. (Munic. Hosp., Kassel, Germany), elmair, E. Wildhirt and H. Ortmans. *Deutsch Wschr* 94(43):2215-2220, 1969.

ution of chronic hepatitis was followed in 448 ents investigated periodically by biopsy and scopy during a 5-year period. At the time of ial diagnosis distinction was made between y and late stage, and 3 categories were formed rding to the disease course including chronic isting hepatitis characterized by continuation nflammatory activity over at least two years bsence of progressive parenchymal damage; ic aggressive hepatitis with invasion of ammatory infiltrate into parenchyma; and ic necrotizing hepatitis distinguished by e episodes of necroses, icterus and high enzyme es. The prognosis was more favorable than cted: progression to liver cirrhosis occurred % of the total patient sample, healing in the of a transition to inactive fibrosis in 35%, nchanged activity in 51% of the cases. In iple, the prognosis of chronic persisting itis was good, and that of chronic aggress- epatitis was better than initially assumed only 9% of the patients developing hepatic osis. The prognosis of chronic necrotizing itis was poor. With all forms of hepatitis, osis depended on the stage at which the se was recognized: the earlier hepatitis was osed, the better the prospects of recovery.

LABORATORY INVESTIGATIONS IN EPIDEMIC HEPATITIS. *(Ger.)* Lembke, A. (Inst. Virus Sielbeck-Eutin, Germany), K.E. Milczewski . Lembke. *Zbl Bakt* 210(4):425-447, 1969.

strains of virus isolated from hepatitis ents were investigated for serological cross tions by means of complement fixation. The tes were uniform with respect to serological, ral and morphological characteristics although were obtained from different patients, at rent times and from various geographic regions. were no serological cross reaction with Herpes ex, mumps, para-influenza viruses and adeno- .

CHIMPANZEE ANTIBODIES TO AUSTRALIA ANTIGEN. *(E.)* Lichter, E.A. (U. Illinois Ctr., Chicago). *Nature* 224(5221):810-811,

samples from 3/62 healthy chimpanzees contain- ecipitating antibody to Australia antigen, eacted with antigens in the sera of 5 other anzees. Human antisera against Australia en also reacted with the serum antigens of 5 chimpanzees. Immuno-electrophoresis of ntigen- containing serum following its reaction chimpanzees antiserum revealed an α_2- mobility pitin arc. Serum protein from an Australia antigen-containing chimpanzee was emulsified in Freund's complete adjuvant and produced high titers of precipitating antibody to Australia antigen after i.m. injection in non Australia antigen-containing chimpanzees. DEAE-cellulose column fractionation identified the specific Australia antigen antiserum as a gamma-G-globulin.

0607 AUSTRALIA-SH ANTIGEN IN HEPATITIS PATIENTS IN LONDON. *(E.)* Cossart, Y. (Virus Reference Lab., London, England), P.E.Taylor, J. Vahrman and A.J. Zuckerman. *Brit Med J* (5673):755-756, 1969.

Australia-SH antigen was detected in serum samples from 11/27 (40%) patients with acute viral hepatitis by testing (immunodiffusion in agarose gel) against sera containing Australia-SH antibodies of human origin. Six of the eleven positive serum samples were collected within the first 12 days of illness and the remaining five between the 13th and 30th days.

0608 FAILURE OF AUSTRALIA ANTIBODY TO PREVENT POST-TRANSFUSION HEPATITIS. *(E.)* Holland, P.U. (Clin. Ctr. Natl. Inst. Hlth., Bethesda, Md.), J.H. Walsh, A.G. Morrow and R.H. Purcell. *Lancet* II(7620):553-555, 1969.

In a prospective study of 64 patients who received multiple transfusions at the time of open-heart surgery, the presence in the serum of Australia antibody was studied in relation to the development of post-transfusion hepatitis. Australia antibody developed in 2/32 patients with hepatitis and in 4/32 patients without hepatitis. Australia antigen was found in 4 patients with hepatitis but was not detected in those without hepatitis. The coexistence of both Australia antigen and Australia antibody, which was shown to be present before the onset of post-transfusion hepatitis, did not prevent the disease. The occurrence of hepatitis in patients with antibody to the Australia antigen suggests that this antibody does not completely protect against hepatitis, or alternatively, that hepatitis was caused by an agent serologically distinct from Australia antigen.

0609 S.H. ANTIGEN IN HEMODIALYSIS-ASSOCIATED HEPATITIS. *(E.)* Turner, G.C. (Regional Publ. Hlth. Lab., Liverpool, England) and G.B. Bruce White. *Lancet* II(7612):121-124, 1969.

Serum from staff and patients associated with a renal hemodialysis unit involved in an outbreak of blood-borne hepatitis was studied for the presence of S.H. antigen by the micro-Auchterlony technique of Prince. Blood from 9 staff members with hepatitis was obtained not more than 2 weeks after the onset of disease, and S.H. antigen was obtained in 7; within 3-5 weeks of onset, the antigen was no longer detectable. Among 17 patients on maintenance hemodialysis, positive reactions were obtained from 6 with a definite history of hepatitis and from 3 who had been given numerous blood transfusions. Of these 9, 8 gave strongly positive reactions for S.H. antigen, which unlike those in members of staff with hepatitis, did not weaken significantly with the passage of time. After 2 of these patients had begun hemodialysis at home, close relatives who assisted with the dialysis procedures developed hepatitis, and in 1 instance blood obtained from the infected relative was positive for S.H. antigen. Results are consistent with epidemiological studies which had already incriminated the blood of these patients as the vehicle for transmission of the virus, and suggest that a positive test for S.H. antigen in serum is related to the presence of hepatitis virus.

0610 PROGNOSIS OF CHRONIC HEPATITIS: II. DURATION OF DISEASE. *(Ger.)* Selmair, H. (Munic. Hosp., Kassel, Germany), I. Vido and E. Wildhirt. *Deutsch Med Wschr* 94(43):2220-2222, 1969.

Prognosis and duration of chronic hepatitis depend on both the form and the evolutional stage. Late stages of chronic aggressive and particularly of chronic necrotizing hepatitis show a significantly greater percentage of progression to cirrhosis than do the early stages. Chronic persisting hepatitis may be considered as a protracted, although benign disease variant. However, occasional transitions to the aggressive form of hepatitis which have been noted after years of inactivity suggest that careful surveillance is required for prolonged periods.

0611 HEPATITIS ANTIGEN: DETECTION OF INFECTIOUS BLOOD DONORS. *(E.)* Gocke, D.J. (Columbia U. Coll. Phys. and Surg., New York, N.Y.), H.B. Greenberg and N.B. Karey. *Lancet* II(7614): 248-249, 1969.

Acute hepatitis developed in 9/12 (75%) recipients who received donor blood containing hepatitis antigen. Hepatitis antigen was detected in the serum by a two-dimensional immunodiffusion technique in 7/9 patients during the incubation period and early stages of hepatitis. Three of the 9 patients were well and without hepatitis antigen, 4-7 months after transfusion. Acute viral hepatitis developed in 4/69 (5.8%) recipients who received donor blood which did not contain hepatitis antigen; hepatitis antigen was not detected in the serum of these four patients. Data indicate a positive correlation between the presence of hepatitis antigen in donor blood and the development of hepatitis following transfusion.

0612 HERPES SIMPLEX HEPATITIS IN AN ADULT. *(E.)* Diderholm, H. (Inst. Med. Microbiol., U. Uppsala, Sweden), U. Stengram, K.B. Tegner and R. Willén. *Acta Med Scand* 186(3): 151-155, 1969.

0613 HEPATITIS IN A HAEMODIALYSIS UNIT. *(E.)* Ringertz, O. (Nat. Bacteriol. Lab. Karolinska Hosp., Sweden) and B. Nyström. *Lancet* II(7623):745-746, 1969.

0614 HEPATITIS PROPHYLAXIS ABROAD: EFFECTIVENESS OF IMMUNE SERUM GLOBULIN IN PROTECTING PEACE CORPS VOLUNTEERS. *(E.)* Woodson, R.D. (Publ. Hlth. Serv., Atlanta, Ga.) and J.J. Clinton. *JAMA* 209(7):1053-1058, 1969.

0615 GLUCOCORTICOIDS IN LIVER DISEASES. *(E.)* Quaade, F. (no affil). *Acta Med Scand* 500:49-54, 1969.

0616 MORBIDITY AND MORTALITY WEEKLY REPORT. *(E.)* Anonymous. *Morbidity and Mortality* 18(45):393-400, 1969.

0617 AUSTRIAL ANTIGEN AND HEPATITIS. *(E.)* Anonymous. *Lancet* II(7612):143-144, 1969.

0618 SERUM LIPIDS IN INFECTION. *(E.)* Gallin, J.I. (Cornell U. Med. Ctr., New York, N.Y.), D. Kaye and W.M. O'Leary. *New Eng J Med* 281(20):1081-1086, 1969.

0619 HEPATITIS VIRUS. *(E.)* Anonymous. *Lance* II(7620):577-578, 1969.

0620 ACUTE HEPATITIS. *(It.)* Pisi, E. (no affil), G. Cavalli, F.B. Bianchi and R. DiFeliciantonio. *Bull Sci Med* 141(3):311-318, 1969.

0621 AUSTRALIA-ANTIGEN AND VIRAL HEPATITIS. *(Ger.)* Scriba, M. (Sandoz Res. Inst., Vienna, Austria). *Deutsch Med Wschr* 94(44):2294-2296, 1969.

0622 SIMPLE TECHNIQUE OF CROSS CIRCULATION USED AS A TEMPORARY METHOD OF HEPATIC ASSISTANCE IN SEVERE JAUNDICE FROM VIRAL HEPATITIS. *(Fr.)* Muller, J.M. (C.H.U. Grenoble, France) M. Guignier, D. Cordonnier, J.L. Debru and A. Franco. *Presse Med* 77(42):1483-1484, 1969.

0623 PANCYTOPENIA DUE TO BONE MARROW APLASIA DURING INFECTIOUS HEPATITIS. (REVIEW OF THE LITERATURE AND REPORT OF TWO CASES). *(It.)* Castelli, S. (Civil Hosp. Pescara, Italy), M. Rubertelli and S. Mene. *Pediatria (Napoli)* 77(3): 371-390, 1969.

0624 AUSTRALIA ANTIGEN AND ETIOLOGY OF VIRAL HEPATITIS. *(It.)* Anonymous. *Policlinico* 76(40):1293-1295, 1969.

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HEPATITIS", THE SO-CALLED "HEPATITIS WITH
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Florence, Italy) and E. Pavari. *Arch de Vecchi
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26 BLOOD GROUPS IN INFECTIOUS HEPATITIS. *(Rus.)*
Demidova, A.N. (*Med.Inst., Ivano-Frankovsk,*
SR). *Vrach Delo* (9):107-109, 1969.

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etynov, V.M. (Inst. Improvement Phys., Kiev,
SR) and D.A. Bugera. *Vrach Delo* (9):109-112,
69.

28 ETIOPATHOGENESIS AND DEVELOPMENT OF
CHRONIC HEPATITIS. *(Ser.)* Burijan, J.
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29 TWO CASES OF APLASIA OF THE BONE MARROW
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(Dan.) Amtoft, A. (Marselisborg Hosp., Arhus, Denmark) and N. Jacobsen. *Ugeskr Laeg* 131(45): 1929-1935, 1969.

0630 VIRAL HEPATITIS: EPIDEMOLOGY, CONTROL AND PROPHYLAXIS. *(Sp.)* Gutierrez, J.M. (Prov. Dept. Sanit., Cadiz, Spain). *Rev Sanid Hig Publica* 43(5-6):337-366, 1969.

0631 DIABETES FOLLOWING VIRUS HEPATITIS. *(Pol.)* Franczak, T. *(Miejski Child. Hosp., Lublin, Poland). Pol Tyg Lek* 24(44):1705-1706, 1969.

0632 ANTILIVER ANTIBODIES IN THE COURSE OF VIRUS HEPATITIS AND SEQUELAE. *(Pol.)* Kowalczyk, M. (Acad. Med., Warsaw, Poland). *Pol Arch Med Wewnet* 43(2):1161-1167, 1969.

0633 PRESENCE OF GRANULES IN HEPATIC HISTIOCYTES DURING THE COURSE OF ACUTE HEPATITIS. *(It.)* Cavalli, G. (Inst. Gen. Clin. Med., U. Bologna, Italy), F.B. Bianchi, G. Bacci and A.M. Casali. *Arch De Vecchi Anat Pat* 51(2):919-934, 1968.

See also: 0015 (P:Morph) • 0116 (P:Secr:Hepatobil) • 0483 (D:L.Intest) • 0536,0547 (D:Livbil)

Cirrhosis

0634 TRANSFUSIONAL SIDEROSIS AND LIVER CIRRHOSIS. *(E.)* Sinniah, R. (Inst. Path., Queen's U., Belfast, N. Ireland). *J Clin Path* 22(5):567-572, 1969.

Iron deposition in various organs was examined at necropsy in 6 patients with siderosis due to multiple transfusions for blood dyscrasias. Iron was deposited in the liver and spleen of all 6 patients and in the pancreas of 4. Only 1 patient (with sideroblastic anemia) had cirrhosis of the liver. During a 3 yr period he had received at least 17.2 g of iron into the tissues in the form of transfusions, as well as oral and parenteral iron. This patient and 1 other had pancreatic fibrosis. Three patients with a greater degree of iron overload, and for a longer period, did not develop cirrhosis or fibrosis. There was suggestive evidence that the liver cirrhosis was due to factors other than excess hemosiderin deposition. Concludes that iron absorbed from the gut and stored in excess without having passed through the hemoglobin molecule or the reticuloendothelial system may be toxic.

0635 INDIAN CHILDHOOD CIRRHOSIS: THE NATURE AND SIGNIFICANCE OF CYTOPLASMIC HYALINE OF HEPTOCYTES. *(E.)* Nayak, N. C. (All India Inst. Med. Sci., New Delhi), K. Sagreiya and U. Ramalingaswami. *Arch Path* 88(6):631-637, 1969.

Irregularly shaped cytoplasmic masses of hyaline were present in the hepatocytes of 54 patients with Indian childhood cirrhosis. Their presence in this geographic region and in the age group of 1 to 5 years has diagnostic and prognostic significance. Abundant hyaline bodies implied extensive liver cell damage and was rapidly fatal. The morphology, staining characters, and histochemical reactions of this hyaline revealed its similarity with Mallory's alcoholic hyaline which is probably composed of a phospholipid protein complex with some ribonucleic acid, appears to be derived from the endoplasmic reticulum, and is believed to represent an expression of a toxic injury to hepatocytes.

0636 ROLE OF COLLATERAL CIRCULATION IN THE PRODUCTION OF EPITHELIAL IRON DEPOSITS IN AFRICANS WITH SIDEROSIS AND CIRRHOSIS. *(E.)* Buchanan, W. M. (Dept. Path., U. Rhodesia). *S Afr J Med Sci* 34(2):29-34, 1969.

To ascertain the significance of portal obstruction in determining the distribution of iron deposits in Africans with Bantu siderosis and cirrhosis, the concentrations of iron in the head and tail of the pancreas were compared histologically and chemically in 15 cirrhotics and 15 non-cirrhotics. The mean differences in iron concentration between the two sites (head minus tail) for the non-cirrhotics and cirrhotics were -0.017 and + 0.019 mg iron per g tissue, resp. The results suggest that partial bypassing of the liver by portal blood is not an important factor in the production of widespread epithelial iron deposits found in Africans with siderosis and cirrhosis. There was no evidence that even massive deposits of iron resulted in pancreatic fibrosis.

0637 CHRONIC HEPATITIS: A CLINICOPATHOLOGIC STUDY OF 75 CASES. *(E.)* Alpert, L. I. (Dept. Path., Mt. Sinai Sch. Med., City U. New York, N. Y.) and R. Vetancourt. *Arch Path* 88(6):593-601, 1969.

Histologic patterns were correlated with clinical and laboratory data, including immunofluorescence studies for circulating antibodies in 75 patients with chronic hepatitis. Patients with periportal necrosis, intralobular fibrous extensions from the portal tract, balloon degeneration of hepatocytes at the lobular periphery, and plasmacytic predominance in the inflammatory infiltrate had a generally progressive course, frequently resulting in cirrhosis. These cases were associated with hypergammaglobulinemia and a high incidence of circulating antinuclear, antismooth muscle, and antimitochondrial antibodies. The sexual heterogeneity (28 female, 21 male) of this group and the predominantly negative lupus erythematosus test differed from that of the "lupoid hepatitis" group described by McKay. Several cases showed clinical and histologic features of both chronic active hepatitis and primary biliary cirrhosis, supporting a close relation between these diseases.

0638 FIBRINOLYSIS AT REST AND AFTER EXERCISE IN HEPATIC CIRRHOSIS. *(E.)* Das, P. C. (U. Dept. Med., Roy. Infirm., Edinburgh, England) and J. D. Cash. *Brit J Haemat* 17(5):431-443, 1969.

Fibrinolysis was studied in 37 cirrhotic patients at rest and 15 cirrhotic patients following a treadmill exercise procedure. An outstanding feature of the resting studies was significant elevation in the levels of plasma plasminogen activator and serum fibrin/fibrinogen degradation products, when compared to age and sex-matched healthy controls. There was a significant positive correlation between those two fibrinolytic parameters. No significant difference was demonstrated between cirrhotic patients at rest or following exercise in relation to plasma fibrinogen, euglobulin plasminogen and plasma urokinase inhibitor activity. The exercise studies showed that following an entirely physiological stimulus the plasminogen activator response in some cirrhotics was excessive in terms of either the initial response and/or prolongation of the recovery period from exercise. However, an exaggerated initial response was not necessarily followed by a prolonged recovery period nor was a relation established between the resting levels of plasminogen and an abnormal exercise response. Furthermore, there was no correlation between the increases in plasminogen activator and serum fibrin/fibrinogen degradation products following exercise.

639 CIRRHOSIS FOLLOWING METHOTREXATE ADMINISTRATION FOR PSORIASIS. *(E.)* Epstein, E. H. (Nat'l Cancer Inst., NIH, Bethesda, Md.) and J. D. Croft. *Arch Derm* 100(5):531-534, 969.

640 CIRRHOSIS CAUSED BY METHOTREXATE IN THE TREATMENT OF PSORIASIS. *(E.)* Muller, S. A. (Mayo Clin., Rochester, Minn.), . M. Farrow and D. L. Martalock. *Arch Derm* 100(5): 23-530, 1969.

641 CONSUMPTION COAGULOPATHY IN LIVER CIRRHOSIS. *(E.)* Hörder, M. H. (Dept. Med., Justus Liebig U., Giessen, Germany). *Thromb iath Haemorrh* Supp. 36, 1969.

642 THE ASSOCIATION OF SYPHILLIS WITH HEPATIC CIRRHOSIS: A REPORT OF SIX ASES AND A REVIEW OF THE LITERATURE. *(E.)* Karmi, . (Bristol Roy. Infirm., England), J. L. Thirkettle nd A. E. A. Read. *Postgrad Med J* 45(528):675-679, 969.

643 HEMODYNAMIC STUDIES IN LIVER CIRRHOSIS. *(Kor.)* Koh, W. H. (Yonsei U. Coll. ed., Seoul, Korea), J. K. Kang and H. J. Choi. *orean J Int Med* 12(7):487-490, 1969.

644 ZIEVE-SYNDROME: TWO NEW CASES. *(Ger.)* Pickardt, R. (2nd Med. Clin. U. Munich, ermany) and H. Stahlheber. *Med Klin* 64(43):1982-987, 1969.

645 INFLUENCE OF RHS-BLOCKADE ON THE EXPERIMENTAL DEVELOPMENT OF LIVER IRRHOSIS IN ANIMALS. *(Ger.)* Fleischer, J. (Med. cad. Carl Gustav Carus, Dresden, Germany) and J. rmscher. *Allerg Asthma* 15(1-2):44-48, 1969.

646 THE ACTION OF PITRESSIN ON PORTAL HYPERTENSION DUE TO SCHISTOSOMATIC FIROSIS OF THE LIVER. *(Por.)* Filho, O. D. (Brazil Coll. Surg. Santa Casa, Brazil) and W. C. Gālvao. *Rev Ass Med Minas Gerais* 20(2):131-136, 1969.

0647 SOME ASPECTS OF CIRRHOSES OF THE LIVER IN LEBANON. *(Fr.)* Gedeon, E. E. M. (Ctr. Lab. Publ. Hlth., Beirut, Lebanon). *J Med Lib* 22(4):423-434, 1969.

0648 THE KIDNEY OF CIRRHOTICS. *(Fr.)* Jaillard, J. (no affil). *Lille Med* 14(8):908-916, 1969.

0649 PATHOLOGICAL ANATOMY OF CIRRHOSIS. *(Fr.)* Richir, C. (Fac. Med. Bordeaux, France). *Concours Med* 91(44):7937-7946, 1969.

0650 SYMPLASMS AND TUBULAR HEPATIC STRUCTURES IN THE HISTOGENETIC SECTION OF INFANTILE HEPATIC CIRRHOSIS. *(It.)* Gori, F. (Inst. Anat. Path. Histol., U. Florence, Italy). *Arch de Vecchi Anat Pat* 53(1):139-163, 1968.

0651 A CASE OF SARCOIDOSIS AND PRIMARY BILIARY CIRRHOSIS. *(E.)* Karlish, A. J. (Roy. Berkshire Hosp., Reading, England), R. P. H. Thompson and R. Williams. *Lancet* II(7620): 599, 1969.

0652 BEHAVIOR OF THE FINE INTRAHEPATIC BILIARY DUCTS IN THE COURSE OF PRIMARY BILIARY CIRRHOSIS. *(It.)* Cavalli, G. (Inst. Med. Clin. Med. Ther., U. Bologna, Italy), F. B. Bianchi and G. Bacci. *Arch de Vecchi Anat Pat* 51(2):491-517, 1969.

0653 THE ROLE OF CHOLECYSTOLITHIASIS AND CHOLECYSTITIS IN THE ETIOLOGY OF LIVER CIRRHOSIS. *(Pol.)* Orlowska, J. (Czerniakowski Hosp., Warsaw, Pland). *Wiad Lek* 22(17):1573-1578, 1969.

0654 PRIMARY BILIARY CIRRHOSIS. *(Yug.)* Baskovic, D. (no affil). *Med Glas* 22(11):369-375, 1969.

See also: 0184,0186,0190,0191,0194,0201,0211 (Diagproc) • 0531,0546 (D:Livbil) • 0593 (D:Livbil:Nonv.Hep) • 0604,0615,0632 (D:Livbil:V.Hep)

0655 NONSURGICAL TRAUMA TO THE EXTRAHEPATIC BILE DUCTS. *(E.)* Stone, H.H. (Emory U. Sch. Med., Atlanta, Ga.), C.D. Haynes, K.S. Given and R.B. Smith, III. *Southern Med J* 62(11):1323-1326, 1969.

0656 CONGENITAL ABSENCE OF THE GALL BLADDER. *(Sp.)* Rodriquez, E.M. (Oviedo, Spain). *Rev Esp Enferm Apar Dig* 29(3):387-396, 1969.

0657 EPIDEMOLOGICAL AND CLINICO-LABORATORY PARALLELS IN CHRONIC TYPHOID CARRIER STATE AND TYPHOID FEVER. *(Rus.)* Dalmatov, D.M. (Med. Inst., Omsk, USSR). *Zh Mikrobiol* 46(9): 123-126, 1967.

0658 SOLITARY WOUNDING OF GALLBLADDER FROM BLUNT ABDOMINAL TRAUMA. *(E.)* Schechter, D. (New York Med. Coll., New York). *New York J Med* 69(22):2895-2901, 1969.

0659 TRANSHEPATIC INTUBATION OF THE COMMON BILE DUCT FOR INOPERABLE OBSTRUCTION — EXPERIENCE WITH 20 CASES. *(E.)* Heydenrych, J.J. (Dept. Surg., U. Stellenbosch and Karl Bremer Hosp., Bellville, South Africa), F.D.du T.van Ziji and J.J.W. van Zyl. *J Surg Oncology* 1(1): 63-75, 1969.

0660 HETEROTOPIC TISSUES IN THE GALLBLADDER. *(E.)* Curtis, L.E. (Boston City Hosp., Boston, Mass.) and D.G. Sheahan. *Arch Path* 88(1): 677-683, 1969.

0661 RADIOLOGIC DIAGNOSIS OF CALCULUS-FREE GALLBLADDER DISEASE. *(Ger.)* Frommhold, W. (Radiol. Inst., U. Tubingen, Germany). *T Gastroent* 12(3):201-218, 1969.

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0664 CANCER OF THE GALLBLADDER. *(Fr.)* Dony, A. (Inst. Med. Surg. Schaerbeek, Brussels, Belgium) and M. Deschreyer. *Acta Gastroent Belg* 32(7-8): 575-604, 1969.

0665 100 CASES OF ODDI'S SPHINCTEROTOMY. *(Fr.)* Terquem, J. (no affil). *Bull Soc Chir Paris* 59(3): 151-153, 1969.

0666 A LATERAL OR A TERMINAL CHOLEDOCO-DIGESTIVE ANASTOMOSIS WITH RESPECT TO AN UNUSUAL COMPLICATION. *(Fr.)* Salembier, Y. (no affil). *Lille Med* 14(8):903-904, 1969.

0667 ON SOME OBSERVATIONS OF RARE CHOLECYSTOPATHY (A CLINICAL AND ANATOMOPATHOLOGICAL CONTRIBUTION). *(It.)* Boscaino, N. (Cardinal Ascalesi Hosp., Naples, Italy), P. Gambardella and I. Piscicelli. *Rass Int Clin Ter* 44(17):1108-1116, 1969.

0668 ATRESIA OF THE BILIARY TRACT: PRESENT STATUS. *(It.)* Savino, L. (Dept. Clin. Surg. Therap., U. Pavia, Italy) and R. Bragheri. *Minerva Chir* 24(16):887-902, 1969.

0669 CONSIDERATIONS OF CASE MATERIAL ON 1166 PATIENTS OPERATED FOR DISEASES OF BILIARY DUCTS. *(It.)* Paolini, A. (Inst. 1st. Gen'l Surg. Clin. Surg. Therap., U. Rome, Italy), M. Flammia, A. Ciancarelli and A. Malizia. *Gaz Int Med Chir* 74(18):1577-1596, 1969.

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0673 DIFFICULTY OF INTERPRETATION OF CERTAIN ASPECTS OF OPERATIVE CHOLIANGTOGRAPHY. *(Fr.)* Roux, M. (Hosp. Vaugirard, Paris, France), P. Vayre and L. Marie. *Sem Hop Paris* 45(41): 2562-2563, 1969.

0674 ACUTE CHOLECYTITIS IN AN ELDERLY PERSON. *(Sp.)* Manrique, J. (San Martin Polyclin., Buenos Aires, Argentina), P. Maslo and O. Yrbas. *Prensa Med Argent* 56(18):828-831, 1969.

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(Hosp. of Surg. Serv., Valpariso, Spain), G.
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) THE PATHOLOGY OF JAUNDICE IN ACUTE CHOLE-
CYSTITIS. *(Sp.)* Gallardo, C.S. (Fac. Sci.
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0687 THE BIOLOGICAL EFFECT OF 50-MEV PROTONS ON CELLS OF THE INTESTINAL EPITHELIUM OF MICE. *(Rus.)* Mastryukova, V. M. (no affil) and A. D. Strzhizhovskii. *Kosmicheskaya Biol Med* (4): 41-45, 1969.

Mice exposed to 50-Mev protons, at doses of 250, 500, and 750 rads, were killed 1-9 days after irradiation and histological sections of rectal and duodenal epithelial cells were prepared. Mitotic activity in the epithelial cells was decreased, with the extent of the decrease being dependent on the dose of irradiation. The recovery process was uniform after the 250-rad dose but was phasic after the 500- and 750-rad doses. Quantitatively, mitosis was practically restored after 3 days, but qualitatively there was still considerable aberrant mitotic activity. Normal mitotic activity was restored about 7 days after cessation of irradiation.

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0702 GLUCOCORTICOIDS IN GASTROENTEROLOGY. *(E.* Riis, P. (no affil). *Acta Med Scand* Supp. 500:55-60, 1969.

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See also: 0306 (D:Stomduo) • 0393,0394 (D:S.Intest) • 0534,0537 (D:Livbil)

0710 IN VITRO ACTION OF ANTISERA ON THE ADULTS OF CLONORCHIS SINENSIS. *(E.)* Sun, T. (Dept. Path., U. Hong Kong). *Trans Roy Soc Trop Med Hyg* 63(5):582-590, 1969.

The action of immune sera on adult *Clonorchis sinensis* was studied in vitro in the "circumadult" preciptin test. Precipitates of various kinds were consistently demonstrated when the living parasites were incubated with heated or unheated immune sera from experimentally-infected rabbits and guinea-pigs, and from rabbits and guinea-pigs artificially immunized with whole fluke extracts or adult metabolic products. Sera from 18/20 clonorchiasis patients and from 3/20 patients without Clonorchis eggs in the stools were also positive. There was no reaction when the living flukes were incubated with normal sera or with sera against Clonorchis eggs or other parasites, or when dead flukes were incubated with immune serum. When the positive sera were absorbed with metabolic products before incubation, the precipitates were greatly diminished or entirely abolished. Precipitates were located at the oral sucker, the genital pore and the cuticle, and also lay free and suspended in the serum. The parasites began to disintegrate after 24 hours' incubation, and died. In comparisons of normal with immune rabbit sera, and of human clonorchiasis antisera from patients without Clonorchis eggs in the stools, immune rabbit sera and the human clonorchiasis antisera exhibited parasiticidal effects in vitro. The reaction develops remarkably early after infection, but is probably based on an immunological mechanism elicited in infection by absorption of metabolic products secreted by the flukes. The chief sites of these secretions are the oral sucker and genital pore, and, to a lesser degree, the cuticle.

0711 INFECTION OF BABY MICE WITH *SCHISTOSOMA MANSONI*: SOME BIOLOGICAL ASPECTS IN CONNECTION WITH EXPERIMENTAL CHEMOTHERAPY. *(E.)* Pellegrino, J. (Inst. Biol. U. Federal de Minas Gerais, Belo Horizonte, Brazil) and N. Katz. *Trans Roy Soc Trop Med Hyg* 63(5):568-575, 1969.

Albino mice, 2-6 day old, were exposed by paddling to 35±5 or 50±5 cercariae of *Schistosoma (S.) mansoni* per mouse. The mean worm burden from 115 baby mice exposed to 35 cercariae was 20.7 (59.2% of worm return), 53 to 60 days after exposure. Eight to 10 weeks after exposure of the young mice to the cercariae, 70-85% of the schistosomes were found in the mesenteric veins, 5-10% in the liver, and 10-20% in the portal vein. The mortality rate of 662 baby mice exposed to 50 cercariae increased sharply after the 6th week of infection. In 400 20g adult albino mice exposed to 120±10 cercariae, worm return was 18.6% (a mean worm burden of 22.3 schistosomes). The oögram patterns (percentages of the various schistosome elements) in the intestinal wall of infected young mice did not differ from the pattern described for infected adult mice. The response to 14 antischistosomal compounds was compared in groups of young and adult mice experimentally infected with 50 and 120 cercariae of *S. mansoni* resp. A 5 day course of treatment was begun within 7-8 weeks after exposure to the cercariae. Similar responses were noted when oögram changes and hepatic shift of worms were compared in the two age groups of infected mice. Because of the relatively high mortality rate of baby mice exposed to 50 cercariae, exposure to 35 cercariae was considered more adequate for drug screening. The infection of baby mice with *S. mansoni* represented a simple and reliable working model for studies of antischistosomal agents.

0712 DIAGNOSIS AND MANAGEMENT OF AMOEBIASIS. *(E.)* Kasliwal, R.M. (S.M.S. Med. Coll. and Hosp., Jaipur, India), K.S. Ratnu and H. Joshi. *Indian Pract* 22(7):409-414, 1969.

0713 PRESENT STATUS OF THE TREATMENT OF SCHISTOSOMIASIS MANSONI. *(E.)* Coutinho, A. (Schl. Med., Fed. U. Pernambuco, Recife, Brasil). *Rev Inst Med Trop S Paulo* 11(5):363-376, 1969.

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0717 ADVANCES IN HELMINTHOLOGY. *(E.)* Gilles, H.M. (Liverpool Schl. Trop. Med., U. Liverpool, Liverpool, England). *Practioner* 203 (1216):518-524, 1969.

0718 EFFECT ON LIVER CELL FRAGMENTS ON *ENTAMOEBA HISTOLYTICA* IN MONOBACTERIAL CULTURES. *(E.)* Krupp, I.M. (Tulane Univ. Schl. Med., U.S. Publ. Hlth. Serv. Hosp., New Orleans, La.). *Trans Roy Soc Trop Med Hyg* 63(5):625-632, 1969.

0719 TREATMENT OF BILHARZIASIS, DETAILED OBSERVATIONS IN A SINGLE CASE. *(E.)* Blair, D.M. (Blair Res. Lab., Salisbury, Rhodesia) M.C. Weber and V. de V. Clarke. *Cent Afr J Med* Supp to 15(10):11-17, 1969.

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0722 THE SIGNIFICANCE OF LABORATORY STUDIES ON SCHISTOSOMA HAEMATOBIUM. *(Por.)* Azevedo, J.F. (Lab. Radioisotopic Stud. Invest. Trauma., Lisbon, Portugal), M. Lourdes, Sampaio Xavier, M.A. Mattes dos Santos and I. Conceicao Avelino. *J Soc Cienc Med Lisbon* 133(8):607-622, 1969.

See also: 0217,0225,0231 (Diagproc) • 0362 (D:S.Intest) • 0439,0493 (D:L.Intest) • 0534, 0537 (D:Livbil) • 0583,0598 (D:Livbil:Nonv.Hep) • 0646 (D:Livbil:Cirrh)

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Cancer, Polyps, Radiological Detection (0188)*

RECTUM

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CANCER

Large Intestine, Detection, Radiology (0188)*

DIAGNOSIS

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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metaboli Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology have accompanying abstracts.

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NOTE

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LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC,μC	milli-,microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10^{-9})
CNS	central nervous system	pg	picogram (10^{-12})
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
μg	microgram(s)		
hr	hour(s)	resp.	respectively
i.m.	intramuscular	Rev.	review (only in citations)
i.p.	intraperitoneal	RNA	ribonucleic acid
IU	international unit(s)	s.c.	subcutaneous
i.v.	intravenous	sec	second(s)
kg	kilogram(s)	SGOT	serum glutamic-oxalacetic transamina
LD_{50}	median lethal dose(s)	SGPT	serum glutamic-pyruvic transaminase
LDH	lactic acid dehydrogenase	U	unit(s)
m	meter(s)	UV	ultraviolet
M	molar	WBC	white blood cells (leukocytes), white blood count
mEq	milliequivalent(s)		
mM	millimolar	yr	year(s)
μM	micromolar		

SPECIAL NOTICE

This February 1970 issue and subsequent issues of Volume 5 contain abstracts and citations from the current literature beginning approximately with December 1, 1969. The remainder of the 1969 issues (Volume 4) will contain abstracts and citations from the remainder of the 1969 literature not yet covered. Volume 4 should be complete by May 1970. Issues of Volume 5 will be published concurrently.

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

0723 STEROIDS IN NEWBORNS AND INFANTS. IDENTIFICATION OF 24,25-DIHYDRO-$\Delta^{9(11)}$-LANOSTEROL AND 4α,14α-DIMETHYL SUBSTITUTED STEROLS AMONG THE ESTERIFIED AND FREE STEROLS IN HUMAN MECONIUM. *(E.)* Eneroth, P. (Karolinska Inst., Stockholm, Sweden), J. A. Gustafsson and E. Nystrom. *Europ J Biochem* 11(3):456-464, 1969.

The free and ester fractions of lipid extracts of human meconium were analyzed for trimethylsilyl ethers of sterols by gas chromatography-mass spectrometry. Cholesterol and lathosterol were the most abundant sterols in the free (96%) and esterified (75%) fractions. Other sterols in the unesterified fraction included lanosterol and its 24, 25-dihydro-Δ^8-and-Δ^9-derivatives, 4α,14α-dimethyl-5α-cholest-7 (and 8)-en-3β-ol and Δ^7-and Δ^8-methostenol. The percentage of Δ^7-sterols was greater in the unesterified fraction than in the free fraction. There was a preponderance of di- and monomethyl-Δ^8-sterol precursors in the esterified fraction.

0724 IMMUNOFLUORESCENT STUDIES AFTER LIGATION OF THE PANCREATIC DUCT. *(E.)* Hiebert, J. M. (Boston U. Med. Ctr., Massachusetts), E. Mack, M. L. Goodman and R. H. Egdahl. *Surg Gynec Obstet* 130(1):72-76, 1970.

The effects of long-term (2 months to 1 yr) ligation of the pancreatic duct on the structure and insulin content of islet cells was studied in dogs by indirect immunofluorescence. Fasting blood glucose and insulin levels were normal and pancreatic venous blood insulin levels were increased after glucose challenge throughout the period of ligation in all dogs. There was acinar fibrosis and atrophy secondary to duct ligation but beta cells survived extreme shrinkage and fibrosis of the acinar cells and contained insulin for at least one year after duct ligation.

0725 STUDIES ON ENZYMIC ACTIVITY OF RAT LIVER SUBCELLULAR FRACTIONS. *(E.)* Shibko, S. (Dept. Food Sci. Technol., U. California, Davis), A. L. Tappel, J. P. Susz and R. A. Freedland. *J Food Sci* 34(5):462-465, 1969.

The distribution of particulate bound enzymes was studied in preparations of rat liver mitochondria and lysosomes to determine if these enzymes were associated only with mitochondria or partly with lysosomes. Particulate aspartate and alanine amino transferases were distributed only in mitochondria whereas particulate glutathione reductase was distributed equally between mitochondria and lysosomes. Isocitrate dehydrogenase, glycerol-3-phosphate degydrogenase, serine dehydratase, glucose-6-phosphate dehydrogenase, xanthine oxidase, aldehyde oxidase and fumarate hydratase were not present in lysosomes. Lysosomes failed to incorporate ^{14}C-labeled amino acids into proteins but did incorporate ^{14}C-labeled acetate into fatty acids.

0726 EFFECT OF DIET ON PROTEIN SYNTHESIS AND NUCLEIC ACID LEVELS IN RAT LIVER. *(E.)* Haider, M. (U. California Med Ctr, San Francisco) and H. Tarver. *J Nutr* 99(4):433-445, 1969.

The rates of liver protein and plasma albumin synthesis were studied in female rats preconditioned to normal (15-18g), high, low, and protein-free diets for 5 to 7 weeks. Liver protein synthesis was not affected by any of the diets. There was a decrease in the rate of plasma albumin synthesis and liver RNA content, and an increase in liver DNA content in rats fed a protein-free diet. Liver protein content varied directly with dietary protein intake.

0727 COMPARATIVE STUDIES OF THE ADRENERGIC RELAXATIONS IN THE EXCISED JEJUNUM OF RAT, EVOKED BY NICOTINE, TYRAMINE, HISTAMINE, CALCIUM AND TRANSMURAL STIMULATION; WITH A SPECIAL REFERENCE TO THE CATECHOLAMINE RELEASE. *(E.)* Fujimoto, K. Kobe U. Sch. Med., Japan). *Kobe J Med Sci* 15(2): 71-105, 1969.

Adrenergic relaxation of the excised jejunum was used as an indicator of catecholamine (CA) release induced by transmural stimulation and the administration of nicotine, histamine, tyramine or calcium in rats. Transmural stimulation, nicotine and calcium induced CA release from storage sites in the sympathetic nerve endings sensitive to sympathetic impulses while tyramine and histamine induced CA release from storage sites sensitive to tyramine stimulation. Depolarization of the excised jejunum with KCl depleted CA content of sympatnetic impulse- and tyrosine-sensitive storage sites. Spontaneous repletion of CA content occurred in sympathetic impulse-sensitive sites but not in tyrosine-sensitive sites following cessation of depolarization. Bretylium and cocaine enhanced the effects of transmural stimulation, nicotine and calcium and inhibited those of tyramine and histamine on CA content in storage sites. Reserpine and Dibenamine abolished the effects of nicotine, tyramine, histamine, calcium and transmural stimulation on CA content in storage sites, indicating a mechanism of action due to indirect stimulation of the α-receptors which produce adrenergic relaxation of the jejunum of rats.

0728 LACTIC DEHYDROGENASE ISOZYME DISTRIBUTIONS IN VARIOUS CELL TYPES OF THE MAMMALIAN LIVER. *(E.)* Palmer, L. S. (Inst. Zoophysiol., U. Lund, Lund, Sweden), and B. W. Karlsson. *Canad J Biochem* 47(12):1171-1178, 1969.

The distribution of lactic dehydrogenase (LDH) isozyme in whole liver extracts and two well-defined (one rich, the other devoid of connective tissue) liver fractions from various mammalian species was determined by horizontal starch-gel electrophoresis. There were inter- and intraspecies differences in LDH isozyme patterns in whole organ extracts, in the two tissue fractions, and in various cell populations, as exemplified by mouse liver in which the fraction devoid of connective tissue was almost totally composed of LDH isozyme 5. Calculations performed with binomial distribution of isozyme activities in the two tissue fractions, showed that in the rabbit, hamster, guinea pig and cat, the liver is composed of several cell lines, each with a predominant LDH isozyme pattern. Liver cells exhibit isozyme patterns which fit binomial distributions much better than do the connective tissue fractions, indicating that the former fraction contains fewer different cell lines.

0729 MORPHOLOGICAL AND BIOCHEMICAL CHANGES IN RAT LIVER DURING THE EARLY STAGES OF ETHYL CHLOROPHENOXYISOBUTYRATE ADMINISTRATION. *(E.)*

Kaneko, A. (Sapporo Med. Coll, Japan), S. Sakamoto, M. Morita and T. Onoe. *Tohoku J Exp Med* 99(1):81-101, 1969.

Ethyl chlorophenoxy isobutyrate, 100 mg/100g p.o., decreased succinic oxidase activity in liver mitochondria and produced proliferation of the smooth endoplasmic reticulum (after 6 to 12 hr) and increased formation of microbodies without nucleoids and the activities of catalase and D-amino acid oxidase (after 24 hr) in rats. Ethyl chlorophenoxyisobutyrate increased liver weight and protein content in cytoplasm without any histological evidence of liver damage.

0730 INTRACELLULAR LOCALIZATION OF PHOSPHODIESTERASES I AND II IN RAT LIVER. *(E.)*

Erecinska, M. (Inst. Biochem. Biophys., Acad. Sci., Warsaw, Poland), H. Sierakowska and D. Shugar. *Europ J Biochem* 11(3):465-471, 1969.

The intracellular distribution of phosphodiesterases I and II in rat liver were studied by differential and density gradient centrifugation. Phosphodiesterase I was localized in the plasma membrane, and was absent in nuclei, rough microsomes, and the inner mitochondrial membrane. Phosphodiesterase II was localized in the soluble fraction of the lysosomes, and exhibits the latency typical of lysosomal hydrolases.

0731 THE ACTIVATION OF PHOSPHORYLASE IN NEONATAL RAT LIVER. *(E.)*

Cake, M. H. (Dept. Biochem., U. Western Australia, Nedlands) and I. T. Oliver. *Europ J Biochem* 11(3):576-581, 1969.

The percentage of α-glucan phosphorylase (active form) was assayed in the liver of premature rats by the method of Hendrick and Fischer in which activity is measured in the direction of glycogen synthesis. α-Glucan phosphorylase activity was 30% in the late fetal liver, 45% 4 hr postpartum, and slowly declined thereafter towards the initial value at birth. This process was not dependent on DNA-directed RNA synthesis or de novo protein synthesis as both actinomycin D and puromycin did not affect the postpartum activity. Glucose and ergotamine tartrate partially inhibited α-gluc phosphorylase activation when injected at birth and their effects were additive implicating hypoglycemia and hormonal mechanisms in postnatal activation. Fetal and postnatal liver α-glucan phosphorylase was activated by adenosine 3',5'-monophosphate.

0732 INTERCONVERSION *IN VITRO* OF TWO FORMS OF LIVER PHOSPHORYLASE PHOSPHATASE. *(E.)*

Merlevede, W. (Fac. Med., U. Leuven, The Netherlands), J. Goris and C. De Brandt. *Europ J Bioche* 11(3):499-502, 1969.

The activity of dog liver phosphorylase phosphatas was increased following incubation with ATP and Mg ions, was completely inactivated following incubation with ATP alone, and was only slowly activated following incubation with Mg ions alone. Phosphor lase phosphatase preincubated with ATP was reactivated by either Mg ion alone or ATP and Mg ion. The activation and inactivation were dependent on time, temperature and the concentration of ATP and Mg ions. Adenosine 3',5' monophosphate had no effect on the activity of phosphorylase phosphatase.

0733 IMMUNOGLOBULIN-CONTAINING CELLS IN THE LIVER. *(E.)*

Hadziyannis, S. (Evangelismos Hosp., Athens, Greece), T. Feizi, P. J. Scheue and S. Sherlock. *Clin Exp Immun* 5(5):499-514, 1969.

Content of immunoglobulins (G, A, M and D) was determined in liver samples from 64 patients with hepatobiliary diseases (acute and chronic hepatiti cirrhosis, biliary obstruction, cholelithiasis) and 23 with nonhepatic diseases by the fluorescent antibody technique for mononuclear cells containing immunoglobulins (Ig-cells). Ig-cells were found in liver samples from groups of patients with IgA being the predominat cell type in liver diseases, except for primary biliary cirrhosis where IgM cells were predominant. IgG cells were the predominant cell type in non-hepatic diseases. Ig-cell content was markedly increased in liver samples (both hepatobiliary and non-hepatic diseases) with lymphoid infiltration and necrosis. Increased Ig-cell content in liver was not associated with increased serum immunoglobulin levels.

0734 THE EFFECTS OF VAGOTOMY ON THE GASTRIC MUCOSA OF THE RAT. *(E.)*

Crean, G. P. (S. Gen. Hosp., Glasgow, Scotland), A. A. Gunn an R. D. E. Rumsey. *Scand J Gastroent* 4(8):675-680, 1969.

The effects of vagotomy (resection of 1 cm lengths from the anterior and posterior trunks below the aphragm) with pyloroplasty, pyloroplasty alone, d sham operation on the parietal and peptic cell ntent of the stomach were studied in rats. Va- tomy reduced the average number of peptic cells r unit of the surface area of the mucosa by 33%, e total peptic cell population by 34%, the height the fundic mucosa by 19%, and the ratio between e peptic and parietal cells of the stomach. Va- tomy also reduced the total parietal cell popula- on of the stomach. Pyloroplasty did not affect ese parameters.

735 FINE STRUCTURE CHANGES IN THE LIVER IN EXPERIMENTAL HEMOLYTIC ANEMIA.

(E.) Kent, (Chicago Wesley Mem. Hosp., Ill.), O. T. Minich, Orfei and F. Volini. *Amer J Path* 57(3):649- 1, 1969.

enylhydrazine or antierythrocytic serum were used produce hemolytic anemias in rats and the hepatic anges were studied by light and electron microscopy. enylhydrazine administration caused oxidative mage to erythrocytes and Kupffer cell hypertrophy. patocytes showed alterations of sinusoidal borders, tochondrial and lysosomes. Hemolytic serum pro- ced intravascular fragmentation or lysis of throcytes, and the Kupffer cells contained in- sted hemoglobin or erythrocyte fragments. The patocytes displayed the changes seen in phenyl- drazine anemia and contained peripheral blood ements. Other changes included acidophilic bodies, mage to hepatocyte outer membranes, degenerative anges of sinusoidal lining cells, and cellular bris and platelet aggregates in sinusoids.

36 OBSERVATIONS ON THE MORPHOLOGY OF PANCREATIC SECRETORY CAPILLARIES.

(E.) radi, A. F. (Dept. Anat., Emory U., Atlanta, Ga.) d D. J. Brandis. *Z Zellforsh* 101(4):568-580, 69.

e fine morphology of the pancreatic secretory pillaries and the distribution of ATPase in the naliculi was studied by electron microscopy in bino rats. The pattern of the microvilli of the cretory capillary walls differs from that of the inar lumen and the secretory capillaries ramify sally to the level of the Golgi region. The ints of origin from the acinar lumina are con- olled by zonulae occludentes, and gulf-like tensions from the basal surface of acinar cells mmunicate with the secretory capillaries. Fenes- ated blood capillaries occur in the vicinity of e secretory capillaries and share a joint base- nt lamina with the acinar cells. ATPase activity associated with the walls of the secretory capil- ries and not with the basal acinar cell surface. ncreatic secretory capillaries may be channels of sorption which receive material from the general ood circulation rather than mere secretory chan- ls communicating with the duct system.

37 SCANNING ELECTRON MICROSCOPIC STUDY ON THE RAT GASTRIC MUCOSA.

(E.) Ogata, T. kayama U. Med. Sch., Japan) and F. Murata. *hoku J Exp Med* 99(1):65-71, 1969.

e surface structure of the gastric mucosa from the greater curvature of male Wistar rats was studied with a scanning electron microscope. Mucosal specimens were fixed in 10% formalin, dehydrated in acetone, air dried, coated with carbon and gold and examined with the scanning electron microscope. Light microscopy of adjacent specimens showed irregularly convoluted ridges on the surface of the gastric mucosa, and electron microscopy demonstrated that the cells of these areas differed considerably in size and were arranged in grape-like fashion. Five stages of surface cells, corresponding to the phases of exocrine secretion, were observed. In the first stage, there were copious tiny microvilli on the cell surface and no visible secretory droplets. The second stage was characterized by several small pores on the cell surface and a few secretory granules. In the third stage, the pores increased in diameter and sometimes fused into larger pores. In the fourth stage, many mucous granules filled the enlarged cell membrane orifices and in stage 5, the cells were distended and had few remaining granules and an extensive orifice. In another preparation, the gastric pits were broader and the surface mucous cells were in a state of extreme dehiscence after the administration of pilocarpine (0.002 mg/100g, 30 min. before sacrifice).

0738 A HISTOCHEMICAL INVESTIGATION OF THE FUNCTIONAL ORGANIZATION OF LIVER PARENCHYMA.

(Ger.) Sasse, D. (Anat. Inst. U. Tubingen, Germany). *Verh Anat Ges* 125:111-113, 1969.

Liver parenchyma was characterized topochemically by localizing uridinediphosphoglucose glycogen transferase (UDGGT) activity (the enzyme that synthesizes glycogen from glucose) in liver sections. The red stain that newly formed glycogen gives with periodate-leukofuchsin was used to demonstrate UDGGT activity. The periportal zones of the hepatic lobule exhibited high UDGGT activity and the central vein low activity indicating that UDGGT activity may be related to blood supply from the afferent branches of the portal circulation. This was confirmed by injecting India ink into the portal vein of golden hamsters and repeating enzyme determinations. The area of portal circulation marked by India ink coincided with that marked by UDGGT activity. There were great variations in the distances between the zones of enzyme activity and the central vein suggesting that blood supply in the central and peripheral areas of the hepatic lobule is very uneven and that these areas, therefore, do not represent functional units as previously believed. The finding of corresponding UDGGT activity in zones of similar blood supply by the portal circulation is consistent with their function as hepatic units.

0739 ELECTRON MICROSCOPY OF THE DARK ISLANDS IN THE PANCREAS OF THE DUCK.

(Ger.) Kindler, G. (Anat. Inst. U. Heidelberg, Germany). *Verh Anat Ges* 125:169-176, 1969.

The dark islands of duck pancreas which contain the A-cells are predominantly located along the pancreatic ducts and are particularly large in the tail portion of the pancreas. These islands consist of a cell type which is uniform with respect to density of cytoplasm, form and structure of nuclei and topography and contain granules of different forms and sizes and varying degrees of osmophilia and electron density. The granules are surrounded by a ribosome-free membrane. Golgi apparatus and glycogen particles are particularly distinct in the darker, more osmophilic variety of these cells, whereas, spherical bodies are more frequently found in the lighter, less osmophilic cells. There are also intrainsular exocrine ducts, and synaptic vesicles of adrenergic and cholinergic nerves.

0740 ON THE ULTRASTRUCTURE OF THE ENDOCRINE CELLS IN THE EPITHELIUM OF THE GASTROINTESTINAL TRACT. *(Ger.)* Orci, L. (Inst. Histol. Embryol., U. Geneva, Switzerland), W. G. Forssman and Ch Rouiller. *Verh Anat Ges* 125:187-194, 1969.

Two distinct types of endocrine argyrophil cells were revealed in the gastrointestinal tract of the rat and cat by electron microscopy. One type (the serotonin-secreting argyrophil cell) was characterized by electron-opaque polymorphous secretory granules and was kidney- or pear-shaped or elliptic. The other type had round secretory granules, a well-defined membrane and a distinctly visible light space between membrane and secretion product. Both types of cells closely resembled the A-cells of the pancreas. Since glucagon was demonstrated in the intestinal areas in which these cells are found it is possible that they represent the intestinal form of the pancreatic A-cell.

0741 RADIOIMMUNOASSAY OF GASTRIN IN HUMAN SERUM. *(E.)* Hansky, J. (Prince Henry's Hosp., Melbourne, Australia) and M. D. Cain. *Lancet* (7635):1388-1390, 1969.

A sensitive immunoassay for the direct measurement of gastrin in human serum is described utilizing rabbit antibodies to human ^{125}I-labeled gastrin I. Amounts of gastrin as low as 5 pg per ml of human serum could be detected with this procedure and fasting gastrin levels in subjects without gastrointestinal disease ranged from 5 to 290 pg per ml (mean of 113 pg). Mean serum gastrin level was 53 pg per ml in patients with duodenal ulcer and 165 pg per ml in patients with gastric ulcer. Serum gastrin levels as high as 5,000 pg per ml were detected in patients with Zollinger-Ellison syndrome and pernicious anemia. In normal subjects, serum gastrin levels were increased by food and insulin-induced hypoglycemia and decreased by secretin administration.

0742 DETACHMENT OF RIBOSOMES FROM DOG PANCREAS POLYSOMES WITHOUT CONCURRENT POLYPEPTIDE SYNTHESIS. *(E.)* Breillatt, J. (Mole. Anat. Prog., Oak Ridge Nat. Lab., Tenn.) and S. R. Dickman. *Biochim Biophys Acta* 195(2):531-548, 1969.

Ribonucleoprotein particles were isolated from dog pancreas cytoplasm under conditions which had been shown to yield a population that could be divided into monomeric ribosomes, polysomes and large ribosomal aggregates. Polysomes (sedimented between 100 S and 500 S) were active in amino acid incorporation with either aminoacyl-tRNA or an amino acid mixture, formed single and dimeric ribosomes by incubation with minute quantities of beef pancreas ribonuclease, and showed clusters of ribosomes similar to polysomes from other sources in electron micrographs. Differences in the rate or extent of amino acid incorporation did not correlate with different amounts of ribosome detachment suggesting that breakdown may be a process independent of the actual incorporation of amino acids The activity of ribonuclease did not appear to be a significant factor in polysome breakdown in the free amino acid incorporation system. The breakdown of polysomes during incubation in the incorporation mixture was dependent on the presence of GTP and ATP. Conditions tending to decrease the Mg^{2+} and NH_4+ or K+ concentrations destabilized polysome structure. A 30-fold increase of aminoacyl-tRNA above that present in the high-spee supernatant fraction stabilized the polysome again disruption by ATP and GTP. Phosphocreatine enhanc polysome breakdown, probably by maintaining the co centration of ATP, which, at high concentrations, also causes breakdown by chelation of Mg^{2+}. The release of ribosomes may result from the malfuncti of the mechanism that links movement of mRNA throu the ribosomal decoding site to amino acid incorpor tion into polypeptides.

0743 ELECTRON MICROSCOPIC STUDIES OF THE ACTION OF COBALT CHLORIDE ON THE EXOCRIN PANCREAS OF GUINEA PIGS. *(Ger.)* Kern, H. F. (Anat Inst., U. Heidelberg, Germany) and D. Kern. *Virchow Arch Path Anat* 4(1):54-70, 1969.

Single administration of cobalt chloride (A-cell poison) (10 to 20 mg/kg s.c.) to guinea pigs cause dose-dependent progressive degranulation of the exocrine pancreatic parenchyma cells which was associated with increased neoformation of zymogen granules in the Golgi region. Within 24 hr, all canaliculi of the Golgi apparatus were closely packed with material of varying electron density. Repeated injections of cobalt chloride on consecutive days resulted in atrophy of the Golgi apparatus and in its place the cisternae of the endoplasmic reticulum were distended and filled with secretion product which was frequently condensed i the form of small granules. Subsequently, the cyt plasm of the exocrine cells contained osmiophilic bodies which resembled lysosomes and contained var ing numbers of intracisternal granules with or wit out their ribosome-coated membrane, reflecting progressive intracellular degradation of secretory material. Discontinuation of chronic treatment wa associated with reversal of all changes as judged by reappearance of zymogen granules, regeneration of the Golgi apparatus and disappearance of the autophagic lysosomes.

0744 CYSTOPLASMIC CRYSTALLINE AGGREGATES IN MURINE PANCREATIC ACINOCYTES. *(E.)*
'apadimitriou, J. M. (Dept. Path., U. Western
ustralia), M. N-I. Walters and J. M. Archer.
'athology 1(4):289-293, 1969.

Ieedle biopsies of the pancreas of 6 male and 5
'emale 40-day-old mice showed crystalline bodies
ot previously described. These crystalline inclu-
ions were regularly seen in the cytoplasm of about
0% of pancreatic acinocytes, and always were pre-
ent in the basal region of the acinar cell, but
ever in ductular or islet cells. Although the
rystal was surrounded by cisternae of the pancrea-
ic ergastoplasm, it was not contained within their
umen but in the hyaloplasm between adjacent lamel-
ae of endoplasmic reticulum. Electron micrographs
f high resolution showed the crystal to be com-
osed of parallel, dense lines (60 to 70 Å thick)
eparated by less dense interspaces (90 to 100 Å).
'he crystals were usually rectangular, about 1.0 to
.5 microns in length and 0.5 to 1.0 microns in
idth. The significance of these crystalline
odies remains unknown.

745 CHANGES IN LOCATION AND ORIENTATION OF MITOTIC FIGURES IN MOUSE ESOPHAGEAL
PITHELIUM DURING THE DEVELOPMENT OF STRATIFICATION.
E.) Smart, I. H. M. (Dept. Anat., U., Dunde,
cotland). *J Anat* 106(1):15-21, 1970.

he location and orientation of mitotic figures
ere recorded in the esophageal epithelium of
mbryonic and adult mice. Thoracic regions of
ouse embryos of 11, 13, 15, 18 and 20 days post-
onception age and the esophagus of newborn 7- and
4-day-old, and 6-month-old postnatal mice were
ixed in Carnoy's solution, embedded in paraffin
nd serially sectioned. During the initial columnar
hase, all mitotic nuclei lay at the apical pole of
he cell and 94% will give horizontal cleavage. At
he onset of stratification, with only two layers
f cells present, 85% of mitotic figures were found
n the basal layer and 85% of these were oriented
o give horizontal cleavage. The percentage of
orizontally oriented figures declined as develop-
ent proceeded until by 7 days, the proportion was
)% where it was stabilized. The introduction of
tratification is associated with a rotation of
itotic figures to give horizontal cleavage. In
pithelium of mature mice, only one-fifth of super-
icial cells originate from horizontal cleavage;
he majority are recruited from the daughter cells
f previous vertical cleavages.

746 COLUMNAR CELLS WITH SECRETORY GRANULES IN THE LARGE INTESTINE OF THE MACAQUE
"CYNAMOLGUS IRUS"). *(E.)* Schofield, G. C. (Dept.
nat., Monash U., Clayton, Victoria, Australia).
Anat 106(1):1-14, 1970.

ne histological reactions and fine structure of
olumnar epithelial cells of the large intestine as
ell as their secretory activities (which are apparently unrelated to those of the goblet cells and other epithelial cells of the large intestine) were studied in 11 macaque monkeys. Several varieties and sizes of subnuclear inclusions were found in the columnar cells (secretory granules) of the intestinal glands and in surface cells of the glandular part of the anal canal. Microvilli of secretory columnar cells of intestinal glands showed an unusual range of variation in form, due possibly to variable cell activity. Surface columnar cells (other than those in the anal canal) did not contain collections of secretory granules and their microvilli were more regular in shape. The fine structure and histochemical reactions of secretory cells of intestinal glands indicate that their secretion is different from that of goblet cells and that it is a protein structure.

0747 ENZYMATIC ACTIVITY OF RAT LIVER PRESERVED IN DEEP FREEZE. *(Fr.)* Pietu, R. (Hosp. Parrot, Bicetre, France) and Ph. Tron. *Rev Franc Etud Clin Biol* 14(2):177-182, 1969.

The effects of deep-freeze preservation at -180C and temporary defreezing to +4C on enzymatic activity were studied in liver fragments taken from freshly killed rats and immediately sealed in glass or plastic tubes immersed in liquid nitrogen. Enzymatic activity was determined by the Hers/Schapira techniques, either directly upon unfreezing of the samples or after variable time periods in the defrozen condition. The activities of phosphorylase, aldolase and glucose-6-phosphatase were unchanged by lengthy deep-freeze preservation of the liver fragments but were decreased after 1 or 2 hr of defreezing. If several successive tests are to be made on a same liver sample, alternate freezings and thawings should be avoided, and the main sample should be divided into smaller ones, to be examined separately whenever desired.

0748 PANCREAS ACINAR CELL DIFFERENTIATION. I. MORPHOLOGIC AND ENZYMATIC COMPARISONS OF EMBRYONIC RAT PANCREAS AND PANCREATIC ANLAGE GROWN IN ORGAN CULTURE. *(E.)* Parsa, I. (Downstate Med. Ctr., Brooklyn, N. Y.), W. H. March and P. J. Fitzgerald. *Amer J Path* 57(3):457-487, 1969.

Morphogenesis and activities of amylase, chymotrypsin and lipase were studied by light and electron microscopy in rat embryonic (day 13 through day 22 of gestation) pancreas and in rat pancreatic anlage grown in organ culture for 1 to 22 days. Both embryonic and organ culture pancreas followed parallel synchronous paths of development from an early appearance of distinctive growing buds of epithelial cells in the midst of mesenchyme, to tubule formation, elongation and branching of tubules into acinar configuration, and the emergence of the distinctive adult acinar cell. Amylase, lipase and chymotrypsin activities increased with embryogenesis and development of organ culture and were correlated with the appearance and degree of development of cytoplasmic organelles. The organ culture model appears to accurately reflect differentiation of the embryonic rat pancreas growing *in utero*.

0749 PANCREAS ACINAR CELL DIFFERENTIATION. II. COMPARATIVE D.N.A. AND PROTEIN SYNTHESIS OF THE EMBRYONIC RAT PANCREAS AND THE PANCREATIC ANLAGE GROWN IN ORGAN CULTURE.

(E.) Parsa, I. (Downstate Med. Ctr., Brooklyn, N. Y.), W. H. Marsh and P. J. Fitzgerald. *Amer J Path* 57(3): 489-521, 1969.

The synthesis of DNA and protein (using ^{3}H-thymidine and ^{3}H-lencine, resp., as precursors) was studied by radioactivity counting and autoradiography in acinar cells of rat embryonic (day 13 through day 22 of gestation) pancreas and pancreas anlage grown in organ culture for 1 to 9 days. At comparable age periods, the labeling index in acinar cells was about equal in embryonic and organ cultured pancreas preparations; it decreased to 8% in the 22 day embryonic pancreas and to 5% in the 9 day pancreas anlage. Protein synthesis was higher in the nucleus than in the cytoplasm of acinar cells in 13 to 16 day embryonic pancreas and in 0 to 3 day pancreas anlage but was higher in the cytoplasm after these periods in both preparations. The shift of protein synthesis from nucleus to cytoplasm was concomitant with large increases in zymogen granules, enzymatic activity and ergastoplasm development.

0750 A STUDY ON THE PERMEABILITY BARRIERS BETWEEN DISSE'S SPACE AND THE BILE CANALICULUS.

(E.) Matter, A. (Sch. Med., U. Geneva, Switzerland), L. Orci and C. Rouiller. *J Ultrastruct Res* Suppl. 11:1-71, 1969.

The ultrastructure and functional properties of the junctional complex of the bile canaliculi and the topographic relation between extracellular space of Disse and the biliary system were studied in the rat utilizing fixation, serial sectioning, diffusion tracers, staining and electron microscopy. The ultrastructure of the junctional complex was different, depending on the fixation and staining procedures utilized. The bile canaliculi and space of Disse are separated from each other most often by the junctional cleft and sometimes only by a small portion of hepatocytic cytoplasm. The junctional complex has distinct properties of diffusibility; it is permeable for microcrystalline uranyl acetate and La^{+3} but impermeable to horseradish peroxidase. Serial sectioning revealed that there is no direct communication between the space of Disse and the bile canaliculi.

0751 ANTIGENS OF HUMAN LIVER CELLS: CYTOPLASTIC, MITOCHONDRIAL AND MICROSOMAL FRACTIONS.

(E.) Chordi, A. (Dept. Microbiol., U. Navarra, Pamplona, Spain), T. Lledias, P. Santamaria, C. Alvarez-Moreno and E. Ortiz de Landazuri. *Path Europ* 4(3):209-221, 1969.

The antigenic composition of human liver cells was investigated in mitochondrial, cytoplasmic and microsomal fractions separated by centrifugation for 10 min at 0° C at the respective speeds of 8500g, 15,000g and 100,000g. Immunosera against liver (and its subcellular fractions), kidney and serum were obtained from 3 rabbits. Immunoelectrophoresis was performed to separate the antigens. Thirteen specific liver antigens, 13 liver antigens common with human serum antigens, and 17 liver antigens common with the human kidney antigens were found. In the soluble cytoplasmic fraction, there were 8 specific liver antigens, 12 antigens common with serum, and 12 antigens common with the kidney. In the mitochondrial fraction, there were 7 specific liver antigens, 7 common with serum and 6 common with the kidney. In the microsomal fraction, 6 specific liver antigens, 6 common with the kidney and 6 common with serum were found. Of the total of 43 antigens studied, 11 were common to all 3 subcellular fractions, 5 were found in 2 fractions and 27 were noted in only 1 fraction. Thirteen of the antigens were identified.

0752 HISTOCHEMICAL STUDIES OF SMALL AND LARGE BOWELS PART 1 SOME ENZYMATIC ACTIVITIES OF NORMAL HUMAN AND LABORATORY AMINALS.

(E.) Iwai, N. (Fac. Med., Kyoto U., Japan). *Jap Arch Intern Med* 16(6):227-241, 1969.

The localization of 10 enzymes (alkaline phosphatas acid phosphatase, succinic dehydrogenase, lactic dehydrogenase, glucose-6-phosphate dehydrogenase, nicotinamide adenine dinucleotide diaphorase, monoamine oxidase, leucine aminopeptidase, glucose-6-phosphatase and lipase) was studied in the small and large intestine of man, Wistar rats, Hartley guinea pigs and Dd/s mice. The small intestine showed more intense enzyme activities than the large intestine and localization and intensity of enzymatic activity was similar in all species. In man, acid phosphatase activity was light to moderat in the surface epithelium of the large intestine, while staining was absent or faint in the other 3 species. Succinic dehydrogenase staining in the epithelium of the small intestine varied among the 4 species, being weakest in the guinea pig and strongest in the mouse. The guinea pig colon surface epithelium stained more heavily for succinic dehydrogenase than the other species. In the rat and mouse, nicotinamide adenine dinucleotide diaphorase activity was not as strong in the small intestinal epithelium as in the mouse and man. Lactic dehydrogenase activity was less in the colo than in the small intestine of all the species except the guinea pig in which moderate activity at the colonic surface epithelium exceeded the activi of the small intestine.

0753 ELECTRON MICROSCOPIC STUDY OF EXPERIMENTA VIRAL HEPATITIS I. EARLY CHANGES OF THE LIVER OF I.C.R. MOUSE FOLLOWING INOCULATION OF M.H. 2 VIRUS.

(E.) Kakimoto, S. (Jikei U. Sch. Med., T Japan). *Jikeikai Med J* 16(2):57-74, 1969.

Structural alterations in the livers of mice 1 to hr after i.v. infection with emulsions of M.H.V.-2 virus were studied by electron microscopy. At 3 hr after infection, there was shortening of the rough surface endoplasmic reticula and narrowing of the glycogen area in both liver and Kupffer cells. At 6 hr, there was mitochondrial swelling, an increase in microbody content, a decrease in glycogen particle content, and a furthur shortenng of rough surface endoplasmic reticula and welling of Kupffer cells. At 12 hr and beyond, iver cells became necrotic and micronodules formed by Kupffer cells, lymphocytes and mesenchyal cells) and acidophilic bodies appeared. At 6 to 48 hr, oval-shaped M.H.V.-2 virus particles 700 to 900 Å in diameter) were detected in the pace of Disse, vesicles of liver cells, and upffer cells.

754 FAT STORAGE CELLS IN THE LIVERS OF PROTEIN DEFICIENT RATS. *(E.)* Archer, . M. (Dept. Path., U. Western Australia) and J. . Papadimitriou. *Pathology* 1(3):205-209, 1969.

he production and origin of fat-storing sinusoidal ells in liver were studied by electron microscopy n 12 Wistar rats maintained on a low protein-high arbohydrate diet for 70 days and in 6 control ats maintained on a standard laboratory diet. here were no abnormalities in the livers of conrol rats and lipocytes were observed. In proein-deficient rat livers, the sinusoidal lumina ere narrowed by lipid-filled cells in the sinsoidal walls, throughout the hepatic parenchyma. he lipocytes were located in the space of Disse, edged between adjacent hepatocytes. The derivaion of the lipocytes is unknown. The accumulaion of lipid in these cells may be related to ow concentration of enzymes required for fat atabolism.

755 PANCREATIC DUCT OBSTRUCTION: ULTRASTRUCTURAL MORPHOLOGY OF THE ACUTE HASE. *(E.)* Walters, M. N-I. (Dept. Path. U. Westrn Australia), J. M. Archer and J. M. Papadimitriou. *athology* 1(2):95-104, 1969.

ine structural changes in the mouse pancreas after igation (up to one week) of the duct of Wirsung ere initially dilation of the centroacinar and ntercalary ductules, intraluminal bleb formation, nd accumulation of electron-dense material. Inompetence of apical junctions of acinocytes led o escape of electron-dense secretion into the exracellular spaces. Cytoplasmic lesions included oss of zymogen granules and the temporary formaion of ergastoplasmic whorls. Nerosis was preeded by the production of cytosegrosomes and atrohic acinocytes mimicking ductular cells in appearnce occurred after 1 week.

756 THE FINE STRUCTURE OF THE MONONUCLEAR CELLS IN THE ESOPHAGEAL EPITHELIUM OF SOX LUCIUS L. *(Ger.)* Linss, W. (Anat. Inst. riedrich Schiller U., Jena, Germany). *Verh Anat es* 125:537-540, 1969.

757 MODIFICATION OF CARBON TETRACHLORIDE HEPATOTOXICITY BY PRIOR LOADING OF THE ETICULOENDOTHELIAL SYSTEM WITH CARBON PARTICLES. *E.)* Stenger, R. J. (New York Med. Coll., New ork), M. Petrelli, A. Segel, J. N. Williamson and . A. Johnson. *Amer J Path* 57(3):689-706, 1969.

- P:Secr:Panc (0815)
- P:Secr:Hepatobil (0836)(0837)(0843)(0849)(0857)(0867)(0870)(0874)(0875)(0876)(0877)(0878)(0879)(0881)(0883)(0884)(0885)(0886)(0887)(0888)(0889)(0890)(0891)(0892)(0893)(0894)(0895)(0897)(0898)(0899)(0900)(0901)
- P:Secr:Int (0909)(0914)(0916)(0922)
- Diagproc (0964)
- D:Stomduo (1025)(1032)(1033)(1057)(1060)(1061)
- D:Stomduo:Peptulc (1122)
- D:L.Intest (1224)
- D:Pancreas (1305)
- D:Livbil (1366)(1368)
- D:Livbil:Nonv.Hep (1397)(1400)
- D:Livbil:Gallb (1456)
- D:Gen:Parasit (1553)

0758 THE ABSORPTION OF IONIC, BILIARY, AND PLASMA RADIOCOPPER IN NEONATAL RATS. *(E.)*

Mistilis, S. P. (Roy. Prince Alfred Hosp., Sydney, Australia) and P. T. Mearrick. *Scand J Gastroent* 4(8):691-696, 1969.

The absorption of labeled copper (given intragastrically as ionic, biliary or plasma copper) was examined in suckling and weaned neonatal rats. In suckling rats, there was a progressive reduction in absorption of 1.0 μg biliary radiocopper from 92.6% at 4 days of age to 43.8% at 16 days; weaned rats (21 to 28 days old) absorbed 9.2 to 11.5% of the dose. At a biliary copper dose of 2.5 μg, the absorption was 48.8% at 7 days, 54.4% at 10 days and 34.3% at 16 days; weaned rats absorbed 8.3 to 8.7% of the dose. Cortisone (0.5 mg, s.c.) treated suckling rats and their 10-day-old controls absorbed 15.6% and 64% of 1.0 μg biliary copper, resp., and there was a marked reduction in the amount present in the distal small intestine. When plasma copper (0.5 μg) was given, 12-day-old suckling rats absorbed 74.6% and weaned rats absorbed 20.7%. When cortisone was injected 4 days prior to administration of plasma copper, there was 19.4% absorption as compared to the 74.6% control absorption. The absorption of ionic radiocopper (1 μg) by 4-day-old, 16-day-old and weaned rats was 100%, 62.9% and 44.3%, resp. Cortisone administration 4 days prior to ionic copper administration reduced absorption to 20.8% in 11-day-old rats. Irrespective of the form of administered copper, absorption decreased progressively with age and occurred predominately in the ileum. The amount of copper transported from the intestinal mucosa to the liver and carcass was relatively constant and independent of both the degree of ileal uptake and the form of administered copper.

0759 IRON ABSORPTION IN ADDISONIAN PERNICIOUS ANEMIA. *(E.)*

Boddy, K. (Scottish Res. Reactor Ctr., East Kilbride) and G. Will. *Amer J Clin Nutr* 22(12):1555-1558, 1969.

Absorption of oral iron was studied in 10 postmenopausal women and 2 men with Addisonian pernicious anemia by measuring hemoglobin concentrations, packed cell volume, serum iron, and total serum iron-binding capacity. After an overnight fast, the subjects were given a p.o. dose of 1-5 μC ^{59}Fe in 5 mg of carrier iron and the fast was continued for another hr and whole body absorption was measured. Twenty days later a second whole body count was performed. The mean percentage absorption of iron by the pernicious anemia patients was 12.4 ± 3.3% while normal male and female subjects showed mean absorptions of 9.6 ± 0.9% and 11.4 ± 2.2%, resp. The difference in iron absorption by the pernicious anemia patients and normal subjects was not significant.

0760 USE OF MINIATURE GM COUNTER AND A WHOLE BODY COUNTER IN THE STUDY OF POTASSIUM TRANSPORT BY THE COLON OF NORMAL, SODIUM DEPLETED AND ADRENALECTOMIZED RATS *IN VITRO*. *(E.)*

Barnaby, C. F. (U. Coll. Hosp. Med. Sch., London, England) and C. J. Edmonds. *J Physiol* 205(3):647-665, 1969.

A method utilizing a whole-body and a miniature Geiger-Muller (GM) counter placed in the lumen of the intestine for the study of the absorption rates and kinetics of labeled substances in the mucosal epithelium *in vivo* was applied to the study of K transport by the mucosa of the descending colon of normal, Na-depleted and adrenalectomized male albino rats. The K influx rate was linearly related to luminal K concentration over the range of 5 to 80 mM. Sodium cyanide (20 mM) placed in the lumen for 30 min produced a 50% decrease in electrical potential difference and a 20 and 50% decrease in K secretion rate in the normal and Na-depleted rats, resp. Sodium cyanide did not reduce K influx rate. The mucosal K content attained a steady value after 60 to 90 min of exposure to ^{42}K in the lumen. The ^{42}K content was similar in the mucosa of adrenalectomized and normal animals, but was greater in that of Na-deplete rats. After the luminal solution was replaced by an unlabeled solution, mucosal ^{42}K content decreas in an exponental manner, with one-half of the ^{42}K outflow passing into the lumen. Na depletion increased the transmucosal electrical potential difference and the K secretion rate, and it appeared to increase mucosal K permeability but the kinetic were unchanged. Accumulation of ^{42}K was increased in the mucosa. Adrenalectomy reduced K secretion rate. Two-compartmental analysis of these results indicated that the observed absorption rate of K could not be accounted for by transport through these compartments alone and that most of the ^{42}K crossed the mucosa by a fast pathway not detectabl by the miniature GM counter.

0761 ANIMAL EXPERIMENTAL EXAMINATIONS ON PATHOGENESIS OF ACUTE INTESTINAL RADIATIO SYNDROME. 2. INTESTINAL ABSORPTION AFTER PARTIAL BODY IRRADIATION. *(E.)*

Finck, W. (Inst. Path. Physiol., Friedrich-Schiller U., Jena, Germany). *Radiobiol Radiother (Berlin)* 10(5):637-646, 1969.

The absorption capacity of the small intestine of rats after partial body irradiation with 800 R was studied *in vitro* by measuring glucose transport against a concentration gradient in everted intestinal segments. A transient decrease in active glucose transport was observed at 2 hr after irradiation. Transport was normal one day after irradiation, decreased significantly on day 2 and was abolished on day 3. The decline in transport was related to a parallel increasing loss of intestinal epithelium. After epithelial regeneration from day 5 on, glucose transport increased gradually and returned to normal by day 24.

0762 EFFECT OF PENTAGASTRIN AND BETAZOLE STIMULATION OF THE GASTRIN SECRETION MECHANISM OF RATS. *(Ger.)*

Gheorghiu, Th. (Path. Inst., U. Cologne, Germany), H. J. Klein, H. Frotz V. W. Jirmann and M. Eder. *Klin Wschr* 47(22): 1206-1213, 1969.

The variations in basal gastric secretion under the influence of different doses of pentagstrin and betazole were studied in rats. The action of pentagastrin was dose-dependent and three distinct dose ranges were observed with increasing doses: (1) a submaximal range between 1 to 60 μg/kg with a slow rise predominantly of HCl concentration; (2) a maximal range between 80 and 300 μg/kg with a greater increase in water secretion than acid output; and (3) a supramaximal range from 400 to 2000 μg/kg with inhibition of HCl production. Increasing doses of betazole produced a slower and lesser but almost parallel rise in the rate of water secretion and acid output and a supramaximal inhibition of both HCl and water secretion. The finding that high doses of pentagastrin primarily stimulate and high doses of betazole primarily inhibit water secretion indicates that different mechanisms may be involved in HCl and water secretion and also in the action of the two drugs.

0763 EFFECT OF PHLEBOTOMY AND pH ON IRON ABSORPTION FROM THE COLON. *(E.)* Chernelch, M. (Donner Labs., U. California, Berkeley), R. Fawwaz, T. Sargent and H. S. Winchell. *J Nucl Med* 11(1):25-27, 1969.

The role of the colon in intestinal iron absorption was studied in fasted dogs after intraduodenal or intracecal administration of ^{59}Fe-labeled ferrous citrate and carrier ferrous sulfate. Following intraduodenal administration, 8.6% of the iron was absorbed into the entire body over an initial 2 hr period and an additional 2.7% was absorbed over a 2 week period. The total amount of iron absorbed from the colon was 2.5% and this diminished to 1.3% when the iron was buffered with contents of the ileum on pH 6. Phlebotomy produced a 3-fold increase in the total body absorption of iron and 7- to 10-fold increase in the absorption of iron from the colon after intraduodenal administration of iron. Following phlebotomy, when the pH of the iron introduced into the colon was low (pH 2), all of the iron absorbed into the body occurred within the first 2 hr; when the pH was elevated (pH 6), only one-third of the iron absorbed from the colon into the body occurred during the 2 hr, the remaining two-thirds being absorbed subsequent to this time.

0764 AMINO ACID TRANSPORT IN RAT LIVER AND MORRIS HEPATOMAS: EFFECT OF PROTEIN DIET AND HORMONES ON THE UPTAKE OF ALPHA-AMINOISOBUTYRIC ACID ^{14}C. *(E.)* Baril, E. F. (Duke U. Med. Ctr., Durham, N. C.), V. R. Potter and H. P. Morris. *Cancer Res* 29(11):2101-2115, 1969.

The effects of dietary protein levels, hydrocortisone, glucagon and adrenalectomy on the uptake of α-aminoisobutyric acid-^{14}C by Morris hepatomas (5123C, 7800, 9633, 9618A), host liver and normal liver were studied in rats. Uptake of α-aminoisobutyric acid-^{14}C by hepatoma 7800 was as great as that by host liver, uptake by hepatoma 5123C was 4- to 5-fold greater than that in host and normal liver, and uptake of hepatoma 9618A was one-fourth that of normal liver. Adrenalectomy decreased amino acid levels in hepatoma 5123C in rats fed 12 and 60% protein diets but not in rats fed 30% protein diet. Hydrocortisone and glucagon increased the uptake of amino acids by hepatoma 7800 and host liver but not by hepatoma 9618A or 9633. A relation probably exists between the control of amino acid-metabolizing enzymes in liver and hepatoma tissues.

0765 BILE ACID ABSORPTION FROM THE CECAL CONTENTS OF GERM-FREE RATS. *(E.)* Gustafsson, B. E. (Karolinska Inst., Dept. Germfree Res., Stockholm, Sweden) and A. Norman. *Scand J Gastroent* 4(7):585-590, 1969.

Bile acid absorption in the cecum was studied in Swedish germ free rats after intracecal administation of 24-^{14}C labeled cholic, lithocholic, taurocholic and glycocholic acids. About 20 to 58% of the cholic acids were obsorbed by the cecum with no specific difference in absorption between cholic, taurocholic and glycocholics acids when administered alone or in combination. Lithocholic acid was absorbed by the cecum to a greater extent than cholic acid when both acids were administered in combination.

0766 A MICROPUNCTURE STUDY OF WATER TRANSPORT BY DOG JEJUNAL VILLI *IN VITRO*. *(E.)* Lee, J. S. (U. Minnesota Med. Sch., Minneapolis). *Amer J Physiol* 217(5):1528-1533, 1969.

A procedure of micropuncture of the central lacteal of jejunal villi under various conditions for water transport study was described. A micropipette was placed into the central lacteal and transported fluid was collected by suction. Mean water transport rate of 43 villi was 134±17 mμl/hr per villus. No water transport occurred when the terminal villus end was occluded and water transport rate did not change when the proximal villus end was occluded, demonstrating that water transport is from the villus tip. Water transport rate decreased with increasing osmolarity of the bathing solution. There was considerable variation in villi size and shape in the 70 dogs tested and these morphological variations must be related to the large individual differences in water transport rate. Extrusion of cells from the center of the villous tips was always observed. The microtechnique may prove valuable in studies of intestinal transport of water.

0767 INTESTINAL ABSORPTION OF DIGOXIN-^{3}H IN THE RAT. *(E.)* Caldwell, J. H. (Ohio St. U. Coll. Med., Columbus), J. F. Martin, S. Dutta and N. J. Greenberger. *Amer J Physiol* 217(6):1747-1751, 1969.

Absorption of digoxin-^{3}H was studied in an intestinal loop preparation *in vivo* and in everted duodenal sacs *in vitro*. Absorption of digoxin was linear over a wide range of substrate concentration both *in vivo* and *in vitro*. Digoxin transport *in vitro* was not inhibited by interference with cellular metabolism induced by metabolic inhibitors (dinitrophenol, sodium azide, iodoacetate) or by glucose omission from incubation medium. Digoxin transport *in vitro* was not affected by omission of sodium from incubation medium or by substition of LiCl for NaCl in the medium but equimolar replacements of Na^+ with K^+ produced a marked reduction in transport. Digoxin is probably absorbed by a passive nonsaturable transport process which is not dependent on metabolic energy.

0768 ELECTROLYTE TRANSPORT AND VOLTAGE MEASUREMENTS WITH RAT INTESTINE *IN VITRO*. *(E.)* McKenney, J. R. (Biol. Dept., Batelle Mem. Inst., Pacific Northwest Lab., Richland, Wash.) and M. F. Sullivan. *Amer J Physiol* 217(6):1728-1735, 1969.

The relation between voltage differences across intestinal walls and Cl-transport was studied in Charles River rats by a procedure which allowed repeated flux and voltage measurements across everted, isolated segments of jejunum and ileum. All measurements were made at normal and reduced Na^+ and Cl^- concentrations and determinations on the effects of temperature, chronic bile diversion, and x-radiation on transport and bioelectric properties of intestine were performed. Isolated rat ileum absorbed Cl^- in opposition to an electrochemical difference, thus indicating an active transport process. The ability of intestinal segments for salt transport was related to their ability to develop reversed voltage differences when the extracellular concentration of Na^+ was reduced. Chronic diversion of bile from the intestine improved the ability of the jejunum for both salt transport and reversed voltage differences while prior x-radiation *(in situ)* depressed both of these actions. There was no direct cause-effect relation between Cl^- transport and reversed voltage differences. A mechanism for entrainment may exist between metabolic energy and Cl^- transport, however, they do not require direct involvement of Cl^- in a metabolic reaction.

0769 IRON ABSORPTION IN IDIOPATHIC HEMACHROMATOSIS AND ITS MEASUREMENT USING A WHOLE-BODY COUNTER. *(E.)* Smith, P. M. (King's Coll. Hosp., London, England), B. E. Godfrey and R. Williams. *Clin Sci* 37(2):519-531, 1969.

Seventy-three measurements of absorption and redistribution of orally administered ^{59}Fe were made in 49 patients with idiopathic hemachromatosis by a whole-body counter technique. A significant decrease in whole-body counts occurred over a 5 hr period following ^{59}Fe ingestion, due to redistribution of the iron from the upper abdomen to other parts of the body. The most marked, widely-scattered distribution effects took place in the heaviest subjects. The mean absorption for untreated patients was 13.4% (range 2 to 38), and in normal controls was 14.1% (range 4 to 25). During venesection therapy, there was a marked rise over base line levels with a mean value of 43% in the group studied during the first 6 months, and 52% in those studied from 6 to 18 months following initiation of venesection. Once absorption increased, it was maintained at a constant maximum level, even if the patient became iron deficient. Absorption was at a 63% level in the first year, 52% in 3 to 5 years, and decreased significantly to 44% 5 to 10 years after cessation of ^{59}Fe administration.

0770 HISTOCHEMICAL STUDIES OF SMALL AND LARGE BOWELS: II. HISTOLOGICAL AND HISTOCHEMICAL CHANGES OF HUMAN SMALL INTESTINE IN VARIOUS PATHOLOGICAL STATES (RESULTS OF INTESTINAL BIOPSIES IN 102 CASES). *(E.)* Iwai, N. (Dept. Int. Med., Kyoto U., Japan). *Jap Arch Intern Med* 16(6):243-255, 1969.

0771 DIGESTION AND ABSORPTION IN THE INFANT AND SMALL CHILD. *(Sp.)* Segura, A. S. (Pediat. Clin., U. Catholic, Cordoba, Argentina), C. Rezzonico, S. Carrozzi and M. Passera. *Rev Med Cordoba* 56(56):29-35, 1969.

0772 JEJUNAL ABSORPTION OF AMINOACIDS IN NUTRITIONAL RICKETS. *(E.)* Woodd-Walker, R. B. (Child. Hosp., Birmingham, England), J. D. L. Hansen and S. J. Saunders. *Lancet* II(7635):1428, 1969.

0773 EFFECT OF TESTOSTERONE ON THE ABSORPTION OF FATS IN RAT SMALL INTESTINE. *(Pol.)* Ksiazkiewicz-Szapiro, M. D. (Gastroent Clin., Warsaw, Poland) and M. Beskid. *Pol Arch Med Wewnet* 43(4):1373-1379, 1969.

- P:Secr:Hepatobil (0826)(0846)
- P:Secr:Int (0902)(0917)
- D:Stomduo (1020)
- D:S.Intest:Regent (1208)
- D:Livbil:Gallb (1460)

4 AN ELECTROPHYSIOLOGICAL STUDY OF THE
INNERVATION OF THE SMOOTH MUSCLE OF THE
ON. *(E.)* Furness, J. B. (Dept. Zool., U.
bourne, Parkville, Victoria, Australia). *J
siol* 205(3):549-562, 1969.

nsmission from intrinsic and extrinsic nerves to
gle cells of the longitudinal and circular muscle
ts of isolated guinea-pig and rabbit colons was
mined following application (microelectrodes) of
gle stimuli with a pulse duration of 1 msec.
n intrinsic nerves were stimulated, inhibitory
ction potentials were noted in over 90% of the
ls of the longitudinal muscle coat and in nearly
of those of the circular coat in both animals.
characteristics of the inhibitory junction
entials were similar in the guinea-pig and
bit. Amplitude of the inhibitory junction poten-
ls varied with strength of stimulation, with the
imum amplitude being 25 mV in the guinea-pig and
mV in the rabbit. Facilitation of 2 or 3 suc-
sive inhibitory junction potentials sometimes
urred. The inhibitory junction potentials were
ffected by guanethedine (5 x 10^{-6}g/ml), were
cked by procaine (10^{-4}g/ml) and could not be
cited by stimulation of either the pelvic para-
pathetic or periarterial nerves. In some cells,
inhibitory junction potential was preceded by
rief depolarization. Excitatory junction poten-
ls were noted in about 5% of the cells of the
gitudinal coat, but rarely in the circular coat,
response to stimulation of the intramural nerves.
n the pelvic nerves were stimulated, excitatory
ction potentials were found in 80% of the longi-
inal coat cells in both animals and in 20% of
cular coat cells in guinea-pigs and 10% of the
ls in rabbits. Hyoscine (2 x 10^{-7} to 2 x 10^{-6}
l) blocked the excitatory junction potentials in
guinea-pig colon. When the intrinsic and pelvic
ves were stimulated together, only an inhibitory
ction potential was observed in the circular and
gitudinal coat cells of both animals.

5 A MIGRATING ELECTRIC COMPLEX OF THE CANINE
SMALL INTESTINE. *(E.)* Szurszewski, J. H.
yo Clin., Rochester, Minn.). *Amer J Physiol*
(6):1757-1763, 1969.

lanted platinum electrodes were used to study
electric activity of the small bowel in con-
ous, healthy dogs. A cauded-moving band of
ge-amplitude action potentials (electric complex)
rted in the duodenum and transversed the small
el; as one complex reached the ileum, another
eloped in the duodenum and proximal jejunum.
dad migration of the complex ranged from 6.2 to
cm/min in the proximal bowel and 1.9 to 1.2
min in the distal bowel. The function of these
ctric complexes may be to produce a caudad
rating band of rhythmic segmentation causing the
ement of the interdigestive contents down the
ll bowel in preparation for the next meal.

0776 POSSIBLE POSTGANGLIONIC ADRENERGIC EFFECT OF ANGIOTENSIN IN THE ISOLATED PERFUSED CAT INTESTINAL SEGMENT. *(E.)* Turker, R. K. (Fac. Med., U. Ankara, Turkey). *Arch Int Physiol* 77(4): 587-596, 1969.

Angiotensin, 0.5 to 0.1 µg/kg i.v., inhibited motility of the isolated blood perfused ileum in bilaterally adrenalectomized cats. The effect of i.v. angiotensin was completely abolished by periarterial denervation of perfused ileum. A relaxation period following a short increase in intraluminal pressure and motility of the isolated perfused ileum occurred following close intra-arterial administration of angiotensin; this response to angiotensin was significantly increased by addition of dihydroergotamine to the perfusion medium. The contractile effect of reserpine on isolated perfused cat ileum was potentiated by angiotensin; this effect was partly inhibited by hexamethonium and hemicholinium. Angiotensin seemingly acts on the sympathetic ganglia and then produces an inhibition of intestinal motility; it probably releases catecholamines either in intramural ganglia or in postganglionic neurons.

0777 EFFECT OF SECRETIN AND CHOLECYSTOKININ ON GASTRIC MOTILITY. *(E.)* Sugawara, K. (Coll. Med., U. Florida, Gainesville), J. Isaza, J. Curt and E. R. Woodward. *Amer J Physiol* 217(6): 1633-1638, 1969.

Secretin and cholecystokinin, 1 to 4 U/kg either by single i.v. injection or constant i.v. infusion, reduced both the frequency and amplitude of contraction of the isolated, vagally-innervated canine pyloric antral pouch. Secretin reduced frequency to 74% of control value (17.4 ± 1.21 contractions/5 min) and amplitude to 42% of control value (171 ± 11.6 mm H_2O). Cholecystokinin reduced frequency to 75% and amplitude to 63% of control values. The motility index (product of mean amplitude time frequency in 5 min intervals) was reduced by both hormones. Secretin and cholecystokinin may be important constituents of the enterogastrone complex.

0778 EFFECT OF GASTRIN ON GASTRIC MOTOR ACTIVITY. *(E.)* Sugawara, K. (U. Florida Coll. Med., Gainsville, Fla.), J. Isaza and E. R. Woodward. *Gastroent* 57(6):649-658, 1969.

Pentagastrin was administered i.v. to 104 dogs either as a constant infusion (3 µg/kg/hr) or as a single injection (1 µg/kg). Pentagastrin caused a sharp increase in frequency and an approximately equal fall in amplitude of contractions in vagally innervated preparations. Pentagastrin caused intermittent contractions to become continuous without reduction in contraction pressure in vagally denervated dogs; endogenous gastrin released by acetylcholine perfusion caused almost identical changes in motility in vagally innervated and denervated dogs.

Neither i.v. pentagastrin nor endogenous gastrin caused any observable change in gastric tone.

0779 COMPARATIVE STUDY OF THE EFFECTS OF SUBSTANCE P ON BLOOD PRESSURE, SALIVATION AND INTESTINAL MOTILITY. *(E.)* Lembeck, F. (Pharmacol. Inst., U. Tubingen, W. Germany) and R. Hettich. *Naunyn Schmiedeberg Arch Pharm* 121(12): 216-224, 1969.

0780 INHIBITORY ACTIVITY OF PHYSALAEMIN ON RAT ESOPHAGEAL MOTILITY *IN VIVO*. *(E.)* Nistico, G. (Fac. Med., U. Naples, Italy) and G. Califano. *Arch Int Pharmacodyn* 181(2):414-423, 1969.

0781 EFFECT OF TRANYLCYPROMINE ON THE MECHANICAL ACTIVITY OF RABBIT AORTA AND ESOPHAGUS AND GUINEA PIG TAENIA COLI. *(E.)* Hattori, K. (Sch. Med. U. Hawaii, Honolulu) and S. Shibata. *Europ J Pharmacol* 5(3):291-295, 1969.

- P:Secr:Hepatobil (0901)
- D:Esoph (0987)
- D:Stomduo (1047)
- D:S.Intest (1151)
- D:Livbil:Gallb (1495)

Stomach

32 EFFECTS OF POTASSIUM CHLORIDE AND
CHLOROTHIAZIDE ON GASTRIC SECRETION AND
TRIC MUCOSA IN DOGS. *(E.)* Karacadag, S.
cettepe U. Med. Ctr., Ankara, Turkey). *Amer*
astroent 52(6):495-499, 1969.

effects of intragastric administration of
orothiazide, 500 mg, and potassium chloride,
on gastric secretion and gastric mucosa was
died in dogs with gastric fistulas. Chlorothi-
de did not affect either the light microscopic
earance of gastric mucosa and submucosa biopsies
histamine-stimulated gastric secretion. Potas-
m chloride did not affect histamine-stimulated
tric secretion but produced local hyperemia of
gastric mucosa, characterized by desquamation
mucosal epithelium, interstial edema and en-
gement of submucosal vessels.

3 EFFECTS OF AN ANTICHOLINERGIC DRUG ON
GASTRIC ACID SECRETION IN THE COMATOSE
IENT. *(E.)* Watts, C. (U. Texas Southwestern
. Sch., Dallas) and K. Clark. *Surg Gynec Obstet*
(1):61-63, 1970.

atose patients (severe head injury) with hyper-
retion of gastric acid were treated with tridi-
ethyl chloride (Pathilon chloride), 20 mg i.m.
ry 6 hr. Within 24 to 48 hr after drug adminis-
tion, definite hypochlorhydria was present in all
ients. Gastrointestinal hemorrhage associated
h coma and hypersecretion ceased during tridi-
ethyl administration. There were no drug side
ects.

4 SLOW MOVING PROTEASE AND THE SEVEN
PEPSINOGENS. ELECTROPHORETIC DEMONSTRA-
N OF THE EXISTENCE OF EIGHT PROTEOLYTIC FRAC-
NS IN HUMAN GASTRIC MUCOSA. *(E.)* Samloff, I.M.
rbor Gen. Hosp., Torrance, Calif.). *Gastro-*
erology 57(6):659-669, 1969.

racts of gastric mucosa contained 8 electro-
retically distinct protelytic fractions. The
en fastest proteases are called pepsinogens (Pg)
hrough 7 in order of their decreasing electro-
retic mobility. Maximum activity is at acid pH
they are resistant to alkalinization but de-
oyed by sequential acidification and neutraliza-
n. The eigth and slowest moving protease is not
ected by acidification and neutralization. Only
6 and Pg 7 are found in the distal antrum and
ximal duodenum while all 8 proteases are found
the body and fundus of the stomach. Pg 1 through
re probably produced by the chief cell and Pg 6
Pg 7 may be synthesized by the mucous neck
ls, by the pyloric glands, and by Brunner's
nds.

5 USE OF AN INERT MARKER (PHENOL RED) TO
IMPROVE ACCURACY IN GASTRIC SECRETION
DIES. *(E.)* Hobsley, M. (Middlesex Hosp., Lon-
, England) and W. Silen. *Gut* 10(10):787-795,
9.

Pyloric losses during nasogastric aspiration (double lumen tube) and the causes of random variation in the aspirated volumes of gastric secretion were determined in 24 patients by instilling phenol red (0.15% solution) into the proximal part of the stomach during stimulation of gastric secretion with histamine diphosphate (0.01 mg/kg/hr; i.v.). Concentrations of phenol red in 15-min aspirates were measured photometrically and were used to estimate pyloric losses and the causes for random variation in the volumes aspirated. The average coefficients of variation of repeated samples were 26%. The coefficient of variation of volume diminished as secretion rate rose. Correction by phenol red reduced the average coefficient of variation to 20.87%. The fraction of phenol red lost decreased as the rate of gastric secretion increased. However, the rate of pyloric loss was constant with an average value of 7.1 ml/15 min and was independent of the secretion rate. The quantitative effect of these errors upon the assessment of gastric secretion was minimal at elevated secretion rates but important at low rates.

0786 THE EFFECT OF SECRETIN ON THE BASAL GASTRIC ACID SECRETION IN MAN. *(E.)* Petersen, H. (Ulleval Hosp., Oslo, Norway). *Scand J Gastroent* 4(7):609-616, 1969.

Gastric contents were collected with a gastroduodenal tube (Lagerlof or Levine) from 20 healthy subjects during the basal period and at three 20-min periods following I.V. administration of one clinical unit of pure secretin. The post-secretion gastric volumes and acid contents were expressed as percentages of the calculated mean basal 20-min volume and acid output, resp. In the first post-secretin 20-min period, there was a significant decrease in volume (by 49%) and output (by 43%) of aspirated gastric juice. In the second post-secretin 20-min period, neither volume nor acid output showed values significantly different from basal values. In the third post-secretin 20-min period, the values for volume and acid output were significantly higher than basal values. The concentration of acid in gastric juice was similar during the basal and post-secretin periods.

0787 DOSE OF HISTAMINE FOR MAXIMAL STIMULATION OF GASTRIC ACID SECRETION. MODIFIED SUBCUTANEOUS HISTAMINE TEST. *(E.)* Desai, H. G. (B. Y. L. Nair Charitable Hosp., Bombay, India), F. P. Antia, U. V. Gupte and P. R. Potnis. *Gastroenterology* 57(6):636-640, 1969.

The minimal dose of s.c. histamine required to stimulate maximal acid output was determined in 13 control subjects given 1.2 to 3.2 mg histamine acid phosphate and in 18 duodenal ulcer patients given 1.6 to 3.6 mg histamine. The minimal dose of histamine acid phosphate which stimulated maximal acid secretion was 2.4 mg (50 µg/kg) in control subjects and 2.8 mg (65 µg/kg) in duodenal ulcer patients.

Acid output was decreased in both control subjects and duodenal ulcer patients given a dose of histamine (3.2 to 3.6 mg) considerably greater than the minimal dose required to stimulate maximal acid output. The minimal dose of histamine which stimulates maximal acid secretion probably is determined by the maximal acid secretory capacity of the stomach (parietal cell mass).

0788 FURTHER OBSERVATIONS UPON GASTRIC FUNCTION IN RATS AFTER PROLONGED ADMINISTRATION OF AN ANTICHOLINERGIC DRUG, PROPANTHELINE BROMIDE.

(E.) Kaye, M. D. (Cardiff Roy. Infirm., Wales). *Amer J Dig Dis* 14(11):770-781, 1969.

Gastric acid secretion (measured by test meal and after pyloric ligation) was studied in Wistar rats treated with propantheline bromide for 20 weeks and in 2 control groups of rats (one group treated with saline for 20 weeks). Gastric acid secretion was similar in all three groups. Acid secretion (measured by test meal plus pentagastrin), gastric emptying and fundic mucosal volume were significantly increased in propantheline bromide-treated rats but not in control rats. Only measurements of acid secretion with test meal plus pentagastrin were significantly correlated with fundic mucosal volume. Prolonged parenteral administration of propantheline seemingly leads to an increase in parietal cell mass and maximal secretory capacity.

0789 EXTERNAL STIMULATION OF GASTRIC ANTRUM AND GASTRIC SECRETION.

(E.) Lott, P., Jr. (Michael Reese Hosp. Med. Ctr., Chicago, Illinois), T. Geisel, N. C. Jefferson and H. Necheles. *Amer J Gastroent* 52(6):506-508, 1969.

The effect of external electrical stimulation of the gastric antrum on basal and stimulated gastric secretion was examined in mongrel dogs (1 with a gastric cannula and 2 with Heidenhain pouches). Gastric or pouch secretion was stimulated with a submaximal dose of histamine diphosphate (0.014 mg/kg, s.c.), insulin (0.5 U/kg, i.v.)or by feeding. Basal acid secretion was not increased by electrical stimulation. During electrical stimulation, total acidity of the pouches and cannulated stomach significantly increased with histamine and insulin. In the Heidenhain pouches, there was no significant change in total acid with food and electrical stimulation. Stomach and pouch motility recordings did not show constant or significant antral contractions with electrical stimulation. External stimulation of the gastric antrum in the dog is not an efficient liberator of gastrin.

0790 INHIBITION OF PENTAGASTRIN-INDUCED GASTRIC ACID SECRETION IN MAN BY GLUCAGON GIVEN INTRAVENOUSLY.

(E.) Dotevall, G. (Sahlgren's Hosp., U. Goteborg, Sweden), N. G. Kock and A. Walan. *Scand J Gastroent* 4(8):713-716, 1969.

The effect of glucagon on pentagastrin-induced acid secretion was studied in 8 patients with peptic ulcer. After basal secretion was collected for 15 min., pentagastrin was infused i.v. at a rate of 0.1 μg/kg/min in 5 patients and 0.0025 μg/kg/min in 3 patients. Glucagon (2 mg) was given i.v. after gastric secretion had reached a steady state. When pentagastrin was infused at the higher rate, glucagon produced a moderate but significant decrease of gastric acid output, whic lasted for about 45 min. Blood sugar increased from a mean of 75 mg/100 ml to 125 mg/100 ml. With the lower rate of pentagastrin infusion (which produced a submaximal acid output), glucagon induced a 47% decrease of the gastric acid output during the first 15 min period following injection; secretory output remained depressed for at least 30 min.

0791 ISOLATED GASTRIC PARIETAL CELLS: OXYGEN CONSUMPTION, ELECTROLYTE CONTENT AND INTRACELLULAR pH.

(E.) Croft, D. N. (Boston U. Sch. Med., Mass.) and F. J. Ingelfiner. *Clin Sci* 37(2):491-501, 1969.

Canine gastric mucosal cells, which were 80 to 90% viable and free of muscularis mucosae and submucosa, were dispersed with protealytic enzyne (pronase and collagenase) and prepared into two Cell Suspensions (I and II). Oxygen consumption measurements revealed that Cell Suspension I, which contained 15% of parietal cells, consumed 1.98 (SD 1.26) μl O_2 hr^{-1} 10^{-6} $cells^{-1}$. Cell Suspension II, with 54% parietal cells, consumed 5.38 (SD 1.35) μl O_2 hr^{-1} 10^{-6} $cells^{-1}$. Oxygen consumption was directly related to the number of parietal cells present in the suspensions, and occurred at a constant rate which was higher than in other mammalian tissues. Cell plugs, obtained by centrifugation of Cell Suspension II, containe 83% of parietal cells by volume of cells. High concentrations (wet weight) of sodium were found in both cell plugs and in the isolated gastric mucosa. Intracellular electrolyte measurements c the mucosal cells revealed values of 108 mEq sodi and 122 mEq potassium per liter of intracellular water. Intracellular pH (by DMO method) was 7.28 The interior of the parietal cell contains a high concentration of sodium and is more alkaline than that of a muscle cell.

0792 EFFECTS OF GASTRIC AND JEJUNAL JUICE EXTRACTS ON GASTRIC ACID SECRETION.

(E.) Semb, L. S. (Ulleval Hosp., Norway). *Acta Physiol Scand* 77(4):385-395, 1969.

Specificity of gastric acid secretion inhibition of i.v. injected extracts of gastric antral juic of dogs was compared with extracts prepared from canine fundic and jejunal pouches. The extracts were injected in doses of 1 mg/kg into Heidenhai pouch dogs secreting at a steady state from constantly infused histamine. Extracts of antral juice inhibited gastric secretion by 63% in some dogs, and stimulated gastric secretion by 57% in others. Extracts of fundic acid inhibited gastr secretion by 50.4% in some dogs and stimulated

retion by 54% in others. Extracts obtained
n jejunal secretions inhibited gastric acid secre-
n by 50.6% in some dogs and stimulated secretion
47.7% in others. Rectal temperature was increased
more than 0.5° C by antral juice extracts, fundic
racts, and jejunal extracts. Dialyzed and lyo-
lized extracts from gastrointestinal secretions
tain substances that either stimulate or inhibit
tric secretion and the inhibitory effect cannot
explained solely by the presence of pyrogens in
extracts.

3 STIMULATION OF GASTRIC SECRETION OF PEPSIN BY SECRETIN IN MAN. *(E.)* Ber-
d, A. (Ulleval Hosp., Oslo, Norway). *Scand*
astroent 4(7):617-622, 1969.

tric secretion of pepsin (aspirated by Lagerlof
e) was studied in 35 subjects 1 hr before and
20-min intervals after single i.v. administra-
n of 1 clinical unit/kg of pure secretin. There
a pronounced increase in both concentration
output of pepsin during the first hr after
retin administration. Pepsin levels during the
ond post-secretin hr were similar to pepsin
els (slightly increased) 1 hr before secretin
inistration. Pure secretin definitely stimulates
secretion of pepsin in man.

4 THE EFFECT OF GASTRIC JUICE EXTRACTS ON HISTAMINE AS A GASTRIC SECRETORY STIMU-
T. *(E.)* Semb, L. S. (Ulleval Hosp., Oslo,
way). *Acta Physiol Scand* 77(3):365-371, 1969.

tric juice extracts from isolated, vagally de-
vated gastric antral and fundic pouches
idenhain) were incubated with histamine for one-
f hour and then injected s.c. back into Hei-
nain pouch dogs. The gastric secretory responses
e studied by tandem injections of histamine
ne, histamine plus fundic juice extracts, and
tamine plus antral juice extracts. There was
difference between the secretory responses to
ection of histamine alone, histamine plus
ral juice extract, or histamine plus fundic juice
ract. There was a decreased secretory response
%) in one dog receiving antral juice extract
ne and an increased secretory response (18%) in
dog receiving fundic juice extracts alone.
ral or fundic juice extracts seemingly do not
by interfering with the stimulatory effect of
tamine on oxyntic glands.

5 EFFECT OF ACID IN THE DUODENAL BULB ON GASTRIC SECRETORY RESPONSES TO SHAM FEED-
. *(E.)* Nilsson, G. (Dept. Pharmacol., Karolinska
t., Stockholm, Sweden). *Acta Physiol Scand* 77
:308-315, 1969.

effect of bulbar acidification on gastric
retroy responses to vagal activation by sham
ding was studied in Pavlov pouch dogs with
phageal fistulae and innervated pouches of
duodenal bulb. Reduction of pH in the duodenal bulb to pH 3 to 4 by perfusion (for 5 min) with 0.1 N HCl markedly inhibited acid stimulatory response to 1 and 10 min of sham feeding and slightly inhibited the response to 30 min of sham feeding. Direct vagal excitation of HCL glands is probably not suppressed by the bulbar inhibitory mechanism; instead the bulbar mechanism may inhibit acid responses to vagal activation by interference with gastrin.

0796 HISTAMINE FORMATION IN RAT GASTRIC MUCOSA AND LUNG AFTER INJECTING RESERPINE OR ADRENALINE. *(E.)* Rosengren, E. (Inst. Physiol., U. Lund, Sweden) and S. E. Svensson. *Brit J Pharmacol* 37(3):659-665, 1969.

Histamine-forming capacity of the lung and gastric mucosa was studied in rats after administration of histamine (i.p.), adrenaline (s.c.) and gastrin (i.p.) and after adrenal demedullation. Histamine-forming capacity of the gastric mucosa was markedly increased and that of the lung was almost completely abolished by reserpine and adrenaline. Reserpine-induced changes in the gastric mucosa and lung were accentuated by demedullation of the suprarenals. Histamine-forming capacity in the gastric mucosa was markedly increased whereas that in the lung was not affected by repeated administration of gastrin. The effects of reserpine on histamine-forming capacity may be related to its effects on gastrin and corticosteroid release.

0797 THE INFLUENCE OF GROWTH HORMONE ON SEPARATE DURATION PERIODS OF THE MITOTIC CYCLE IN CELLS OF THE BASAL LAYER OF RAT ESOPHAGEAL EPITHELIUM. *(Rus.)* Bardik, Yu. V. (Acad. Med. Sci., Moscow, USSR). *Biull Eksp Biol Med* 69(11):94-97, 1969.

The influence of somatotropic hormone on various periods of the mitotic cycle in basal epithelial cells of rat esophagus was studied by autoradiography. Growth hormone, 1 mg daily, was injected for 4 days prior to injection of the tritium-labeled thymidine. The rats were sacrificed at intervals from 1 to 25 hr post-injection, sections of esophageal tissue fixed and stained, and the number of labeled and non-labeled mitoses as well as the labeled nuclei (about 100 per section) were counted. About 3,000 cells were counted and the G_2 and S mitotic periods were shortened. Experiments with multiple administration of labeled thymidine (5 times per day at intervals of 5 hr) showed that the growth hormone did not influence the proliferative pool of the esophageal cells.

0798 HISTAMINE FORMATION IN RAT STOMACH: STUDY OF REGULATION MECHANISMS. *(E.)* Schwartz, J. C. (Fac. Pharm. Paris, France), A. L. Ronnberg, Y. Cohen and G. Valette. *Europ J Pharmacol* 5(3):272-278, 1969.

The mechanism for the increase in the activity of histamine-forming enzyme (histidine decarboxylase) in the glandular stomach during food intake was studied in rats. The increase in activity of histidine decarboxylase in the glandular stomach induced by food intake was completely blocked by cycloheximide (inhibitor of protein synthesis) but not by actinomycin D (inhibitor of RNA synthesis). Food-induced activation of histidine decarboxylase was increased by L-histidine but not by D-histidine. Food- , insulin- or gastrin-induced activation of histidine decarboxylase was either completely inhibited or significantly decreased by histamine and aminoguanidine. Modifications of the activity of histidine decarboxylase in the stomach seemingly are related to the synthesis of new enzyme molecules and regulated by the level of histamine in tissue.

0799 INDIRECT HALF LIFE OF SECRETIN. *(Ger.)* Lehnert, P. (U. Med. Clin., Munich, Germany), H. Stahlheber and M. M. Forell. *Klin Wschr* 47(22):1200-1204, 1969.

Secretin half life was estimated by an indirect method in anesthetized dogs because specific chemical serum determination of secretin is not yet possible. The indirect half life of secretin corresponding to the period in which its activity decreases by 50% was judged by relating the parameter of pancreatic secretion to the dose response curve. The indirect half life of secretin was not constant but changed continuously because of the double logarithmic decrease in activity. Half life was 2.9 min with a medium dose (1 unit/kg), 2.2 min with twice this dose, and 4.4 min after one half the dose.

0800 INFLUENCE OF ACUTE HYPERMAGNESEMIA ON GASTRIC SECRETION STIMULATED BY HYPERCALCEMIA. *(Ger.)* Ottenjann, R. (Med. Clin. Polyclin., U. Erlangen-Nüremberg, Germany), P. Deyhle, K. H. Schaller and O. Stalelmann. *Klin Wschr* 47(22):1204-1206, 1969.

The effect of acute hypermagnesemia on gastric secretion previously stimulated by acute hypercalcemia was studied in 10 subjects. During infusion of calcium (1350 mg), gastric secretion showed a statistically significant increase. Subsequent injection of magnesium (455 mg) was associated with a return of gastric secretion to almost control levels.

0801 CHARACTERISTICS OF INHIBITION OF GASTRIC SECRETION BY SECRETIN. *(E.)* Johnson, L. R. (VA Ctr., Los Angeles, Cal.) and M. I. Grossman. *Amer J Physiol* 217(5):1401-1404, 1969.

The inhibition of gastrin-stimulated gastric secretion by secretin was studied in four dogs with Heidenhain pouches and open gastric fistulas. After establishing a constant level of secretion from the Heidenhain pouches by infusing gastrin i.v. at a constant rate (doses doubling from 0.1 to 1.6 g/kg-hr in various tests), secretin (doses doubling from 0.06 to 2.0 U/kg-hr) was given by constant i.v. infusion for 1 hr. From the dose-response curves to gastrin alone and gastrin plus 0.5 U/kg-hr secretin, Michaelis-Menten analysis w typical of noncompetitive inhibition. For maxima rates of gastrin-stimulated secretion, about 0.4 U/kg-hr of secretin was required for 50% inhibition and 1 U/kg-hr produced maximal inhibition. The dose of secretin required for 50% maximal pancreatic stimulation was 1.2 U/kg/hr. In the dog, secretin seemingly is a stronger inhibitor of gastrin-stimulated secretion than it is a stimulator of pancreatic secretion.

0802 METABOLISM OF EXOGENOUS HISTAMINE-^{14}C DURING GASTRIC SECRETION IN DOGS. *(E.)* Navert, H. (Mayo Clin., Rochester, Minn.), E. V. Flock, G. M. Tyce and C. F. Code. *Amer J Physiol* 217(6):1823-1829, 1969.

The metabolism and distribution of ^{14}C-histamine and its metabolites in gastric mucosa, gastric juice and venous plasma was studied in Heidenhain pouch dogs by thin-layer and paper chromatography and by paper electrophoresis. Very little radioactive histamine was detected in venous plasma, gastric mucosa, or gastric juice. 1,4-Methylhistamine accumulated in the gastric mucosa, 1,4-methylimidazole acetic acid in the venous plasma, and an unidentified histamine metabolite in the gastric juice. A concentration gradient existed between venous plasma and gastric mucosa for 1,4-methylhistamine. Methylation appears to be t major pathway of histamine metabolism in the corp mucosa of the dog.

0803 GASTRIC SECRETORY AND MOTOR RESPONSES TO ANTERIOR HYPOTHALAMIC STIMULATION. *(E.)* Mason, G. R. (Stanford U. Coll. Med., Palo Alto, California) and T. S. Nelsen. *Amer J Physi* 217(6):1771-1775, 1969.

The relation of gastric secretory and motor function was studied in dogs by gastric antral pressure wave recordings and gastric fistula secretor measurements performed under control conditions and following electrical stimulation of the anterior hypothalamus. Gastric acid secretion was increased by hypothalamic stimulation at current strengths of 0.08 milliamperes and was decreased by stimulation at current strengths of 0.01 to 0. milliamperes. Following anterior hypothalamic stimulation, there was neither any consistent change in gastric motor function (as measured by changes in amplitude measurements) or any discernable relation of changes in amplitude to gastric acid secretion. Gastric acid secretion may be related to hypothalamic stimulation and gastric muscle fibers which control secretion hav different thresholds than fibers which inhibit secretion.

04 IRON-BINDING CAPACITY OF GASTRIC JUICE. *(E.)* Scott, J. M. (Biomed. Res. Lab., inity Coll., Dublin, Ireland) and O. S. Morgan. *ncet* II(7633):1302-1303, 1969.

05 AUTONOMIC INNERVATION OF THE STOMACH OF A TOAD *(BUFO MARINUS)*. *(E.)* Campbell, G. ept. Zoology, Melbourne U., Parkville, Victoria, stralia). *Comp Biochem Physiol* 31(5):693-706, 69.

06 EFFECT OF TABLET PROCESSING AND FORMULATION FACTORS ON DISSOLUTION RATE OR THE TIVE INGREDIENT IN HUMAN GASTRIC JUICE. *(E.)* lvang, S. (Inst. Pharmacol., U. Oslo, Norway) and Finholt. *J Pharm Sci* 59(1):49-52, 1970.

- P:Absorp (0762)
- P:Motil (0777)
- Diagproc (0938)(0962)(0975)
- D:Stomduo (1020)(1021)(1022)(1026)(1043)(1063)
- D:Stomduo:Peptulc (1111)(1112)(1114)(1121)

Pancreas

0807 EXOCRINE PANCREATIC FUNCTION IN PROTEIN-CALORIE MALNUTRITION DISEASE OF ADULTS.

(E.) Tandon, B. N. (All India Inst. Med. Sci., New Delhi), P. K. George, S. K. Sama, K. Ramachandran and P. C. Gandhi. *Amer J Clin Nutr* 22(11): 1476-1482, 1969.

Exocrine pancreatic function was studied in 16 patients with protein-calorie malnutrition and 10 healthy controls. Duodenal intubation was performed and the volume of pancreatic secretion, as well as amylase, lipase, trypsin and bicarbonate concentrations were measured before and at timed intervals after the pancreozymin-secretin stimulation test was performed. The volume of basal and maximal secretion (10 min after stimulation) was similar in patients and controls, but at 40 min secretion volume was greater in the patients. Control subjects secreted more bicarbonate and enzymes (particularly lipase) than the patients at all periods of collection. Trypsin secretion was significantly increased 20 to 30 min after pancreozymin stimulation in both groups, then output fell to below basal levels at 70 min. Lipase concentration of duodenal juice was increased after pancreozymin stimulation, with peak values at 20 min after injection in the controls and 10 min after injection in the patients. The degree of rise of lipase concentration was significantly greater in controls than patients 30 and 50 min after stimulation. Basal levels of amylase secretion were similar in controls and patients, but at all poststimulatory periods secretion was less in the patients. Both groups showed a significant increase in amylase secretion 10 min after pancreozymin stimulation, but only the controls maintained it 20 min after stimulation.

0808 EFFECT OF FEEDING ON THE PROTEIN SYNTHESIS IN MAMMALIAN PANCREAS.

(E.) Poort, C. (Sch. Med., U. Utrecht, the Netherlands) and M. F. Kramer. *Gastroent* 57(6):689-696, 1969.

Wistar albino rats (representing continuously digesting animals) and ferrets (representing predatory animals which take their food at rather great intervals between feedings) were used to investigate the effect of physiological secretory stimulus on the rate of protein synthesis in the pancreas. In ferrets, the secretory response of the pancreatic acinar cells to food uptake and digestion was rapid, resulting in the loss of a great number of secretory granules, confirmed by an increase in deoxyribonucleic acid concentration in the pancreas. No apparent response was observed in rats. In both species the rate of protein synthesis per cell was the same before and after feeding. Protein synthesis apparently proceeds continuously, at a constant rate, independently of digestion and of extrusion of secretory granules.

0809 ENZYME SECRETION BY THE ISOLATED RABBIT PANCREAS: ABSENCE OF A RELATION WITH NA-K ACTIVATED ATPase. STUDIES ON NA-K ACTIVATED ATPase, XXVII.

(E.) Ridderstap, A. S. (Dept. Biochem., U. Nijmegen, Netherlands) and S. L. Bonting. *Pflugers Arch* 313(1):53-61, 1969.

The effects of ouabain, acetazolamide, anaerobiosis, metabolic inhibitors, and a low sodium environment on enzyme and fluid secretion by the isolated rabbit pancreas were studied. Ouabain ($10^{-5}$and 10^{-6}M) and acetazolamide (10^{-3}M) did not alter α-amylase and protein secretion but inhibited fluid secretion by 28 to 65% and 25%, resp. Sodium fluoride (10^{-2}M) increased both protein and α-amylase secretion but did not affect fluid secretion. Gassing (anaerobiosis) of the fluid bathing the isolated pancreas with 95% N_2-5% CO_2 decreased protein and α-amylase secretion by 57 and 64%, resp., and decreased fluid secretion by 77%. Lowering of the sodium environment in the bathing fluid by 85% decreased α-amylas secretion by 46% and fluid secretion by 77%. The secretion of digestive enzymes across the cell membrane of the acinar cells of the pancreas is probably not coupled to a Na-K-activated system, like that of acinoductular cells.

0810 ADAPTATION OF CANINE PANCREATIC ENZYMES TO DIET COMPOSITION.

(E.) Behrman, H. R. (Sensory Physiol. Lab., North Carolina St. U., Raleigh) and M. R. Kare. *J Physiol* 205(3):667-676, 1969.

Enzyme activity in the pancreatic juice of 3 mongre dogs was determined during the feeding of basal, high fat, high protein and high carbohydrate diets for 3-week periods. Gastric and intestinal cannula were positioned to permit collection of pure pancreatic juice 4 to 5 min after the test food was given. Single samples were obtained at 2 to 3 day tervals during the last 2 weeks of each 3-week peri The specific activity of lipase in the pancreatic juice increased significantly with the increased intake of dietary fat and carbohydrate but not protein. The increases in lipase activity were 2.46 and 0.91 U per each g increase in fat and carbohydrate intake, resp., per kg body weight. The specific activity of protease was not affected by dietary fat level and was only slightly increased (P <0.10) by increasing the carbohydrate intake. Increasing dietary protein augmented protease activit by 1.30 U for each g increase in protein intake/ kg The variations between dogs and/or eating periods were significantly larger than some or all response to the dietary factors for both enzymes. Enzyme activities in pancreatic juice were altered by dietary composition and the response for a given enzym may be influenced by more than 1 dietary constituen

0811 PANCREATIC EXOCRINE SECRETION IN NORMAL SUBJECTS STUDIED BY CONTINUOUS INFUSION OF PANCREOZYMIN AND SECRETIN.

(E.) Schultz, H. B. (Dept. Med., Karolinska Inst., Stockholm, Sweden), S. Andersson and H. Lagerlof. *Scand J Gastroent* 4(7):597-602, 1969.

The effects of constant i.v. infusion of 0.2 U/min/kg of pancreozymin and 0.05 U/min/kg of secretin on exocrine function of the pancreas were ied in normal subjects. The coefficient of ation of amylase output during 40 min infusion ancreozymin was 9.6% and increasing the dose ancreozymin from 0.2 to 0.4 and 0.8 U/min/kg r 100 min of infusion) did not significantly r this rate. Amylase and trypsin output, but volume and bicarbonate secretion, decreased r prolonged (220 min) infusion of 0.2 U/min/kg ancreozymin.

2 EFFECT OF INSULIN STRESS AND HYPOTHALAMIC LESIONS ON THE BEHAVIOR OF ALKALINE PHATASE IN THE A-CELLS OF RAT PANCREAS. *(Ger.)* s, I. (Anat. Inst., Martin Luther U., Halle-enberg, Germany) and H. J. Hildebrandt. *Verh Ges* 125:541-545, 1969.

lin stress abolished alkaline phosphatase ac-ty in pancreatic A-cells of adrenalectomized but not in animals with hypothalamic lesions he presence or absence of the adrenals. agon suppressed alkaline phosphatase activity ancreatic A-cells in all rats. Alkaline phatase activity may be useful as a tool in oring central nervous regulation of glucagon ase from pancreatic A-cells.

EFFECT OF D-GLUCOSE OR D-RIBOSE ON THE TURNOVER OF GLUCOSE IN PANCREATECTOMIZED MAINTAINED ON A MATCHED INTRAPORTAL INFUSION NSULIN. *(E.)* Ishiwata, K. (Dept. Physiol., U. nto, Ontario), G. Hetenyi, Jr., and M. Vranic. *etes* 18(12):820-827, 1969.

4 THE PURIFICATION OF PHOSPHOLIPASE A FROM HUMAN PANCREATIC JUICE. *(Ger.)* Wittich, . (Med. U. Clin., Gottingen, Germany) and chmidt. *Enzym Biol Clin* 10(6):477-486, 1969.

5 STUDIES ON FIN WHALE PANCREATIC PROTEASES. II. PURIFICATION OF THE PANCREATIC EASES. *(E.)* Koide, A. (Eisai Res. Lab., Eisai Ltd., Koishikawa, Bunkyo-ku, Tokyo, Japan) and atsuoka. *J Biochem* 66(4):541-548, 1969.

- P:Morph (0739)(0742)(0743)(0744)(0748)(0749)
- P:Gen (0931)
- Diagproc (0935)
- D:Stomduo (1020)

0816 CHANGES IN ELECTRICAL POTENTIAL WITHIN THE LIVER AND THE KIDNEYS DURING ACUTE SURGICAL CONDITIONS.

(E.) Monsaingeon, A. (Paul Brousse Hosp., Villejuif, France) and M. Schirar. *Europ Surg Res* 1(4):299-308, 1969.

Changes in electrical potential within the liver and kidney were measured in rabbits and other animals during acute anoxia, hypoxia, hemorrhage or cutaneous burns. In the livers of the controls, the potential in the superficial layer (2 to 4 mm depth) was usually 50 to 80 mv below that of the deep layer (12 mm depth). In acute anoxia (from tracheal clamping or breathing 100% N), a drop in potentials began after 2 to 3 min; the changes were higher in the superficial than deep layer of the liver (-30 to -40 mv). After 1 hr in the superficial and deep layers of the liver, decreases were -60 to -150 mv and -30 to -60 mv, resp. Lactic acid increase in the liver was more rapid than the decrease in potential. After 30 to 60 min of hyperoxia (from partial clamping or breathing 6 to 14% O_2), the 2 liver layers showed similar potential drops of -20 to -50 mv. With moderate hemorrhage from the femoral artery (9 to 15 ml/kg) there was a drop of -25 to -50 mv and -50 to -200 mv at the deep and superficial liver layers, resp., within 1 hr. Dextran 40 injected i.v. reversed the changes in potential. Deep cutaneous burns of <10% of the body surface produced inconsistent potential changes in the liver. Measurements of electrical potential in liver give information as to the metabolic state of the parenchyma.

0817 DNA AND PROTEIN METABOLISM AFTER LIVER AUTOTRANSPLANTATION.

(E.) Tamvakopoulos, S. K. (Rhode Island Hosp., Providence), H. T. Randall and J. VanLancker. *Europ Surg Res* 1(4):258-263, 1969.

A 2-stage technique for heterotopic liver autotransplantation was carried out to the diaphragmatic surface of the spleen in albino Sprague-Dawley rats. Histological examinations were performed monthly and glucose-6-phosphatase, protein levels and DNA content were determined in tissue homogenates. The autotransplant survived and the histological structure was maintained for up to 6 months following separation from the main organ. Glucose-6-phosphatase levels in the transplant were identical to those from normal liver 4 months following autotransplantation. Protein and DNA were similar in the transplant and main liver segment. In partially hepatectomized rats, regeneration of the autotransplant paralleled regeneration in the main organ, as measured by ^3H-thymidine incorporation into DNA.

0818 ORTHOPHOSPHATE TURNOVER IN THE EXTRACELLULAR AND INTRACELLULAR SPACE OF MOUSE LIVER.

(E.) Till, U. (Physiol. Chem. Inst., U. Friedrich-Schiller, Jena, Germany), D. Brox and H. Frunder. *Europ J Biochem* 11(3):541-548, 1969.

The flux rates of P_i from blood plasma into the extracellular and intracellular space of mouse liver were measured *in vivo* (using the $[^{32}P]P_i$-tracer and analog computer techniques) by determining the specific radioactivities of plasma P_i and total liver P_i 0.1 to 4 min following injection of carrier-free $[^{32}P]P_i$. The flux rate of P_i from blood plasma int extracellular space was 1.14 µmoles/g liver/min. There was a slower flux rate of 0.39 µmoles/g/min from the extracellular into the intracellular liver space. After a single 0.03 ml i.v. injection of the diluted radioactive solution, the specific radi activity of intracellular P_i was about 7% higher th that of $[\gamma-^{32}P]$ATP. The influx of P_i through the liver cell membrane seemingly occurs without transient transformation into another phosphate compou rapidly exchangeable with large phosphate pools.

0819 ENZYMATIC FLUX RATES WITHIN THE MONONUCLEOTIDES OF THE MOUSE LIVER.

(E.) Zahn, D. (Physiol. Chem. Inst., U. Friedrich-Schiller, Jena, Germany), R. Klinger and H. Frunder *Europ J Biochem* 11(3):549-553, 1969.

The enzymatic flux rates within the mononucleotide pool of normal mouse liver were determined by measuring the radioactivities of the β- and γ-P positions of ATP, ADP, uridine diphosphate (UDP), uridine triphosphate (UTP), guanine triphosphate (GTP) and cytidine triphosphate (CTP) 10 to 60 sec after i.v. injection of carrier-free $[^{32}P]P_i$. Flux constants and flux rates within the mononucleotide pool were calculated with the specific radioactivities. It was only within the first 30 sec after tracer injection that the dynamic phase of tracer kinetics was met and that proper calculations of flux rates of mononucleotides with high turnover could be made. A simplified model applied for the calculation of the flux rates quite accurately described the primary pathways within the complex ne work of possible mononucleotide interconversions. The 33 µmole/g fresh liver/min flux rate (between 20 and 60 sec) from the β-P of ADP to the β-P of ATP indicates preferential catalyzation via oxidative and substrate phosphorylation. Between 10 an 20 sec, the flux rate was 73 µmole/g fresh liver/min. Transfer of 12, 0.7, 0.3 and 0.01 µmoles of the γ-P of ATP per g per min to the β-P of ADP, UD GDP and CDP, resp., was preferentially catalyzed nucleoside monophosphate kinases. The flux rates are 1-2 orders of magnitude less than those expect from *in vitro* measurements. The fluxes of the γ-P of ATP to the γ-P of GTP, UTP and CTP were 9, 4 an 0.5 µmoles/g/min, all catalyzed by nucleoside diphosphate kinase.

0820 MANGANESE-INDUCED CHOLESTASIS: CONCURRE OBSERVATIONS ON BILE FLOW RATE AND HEPAT ULTRASTRUCTURE.

(E.) Witzleben, C. L. (St. Louis Med. Sch., Mo.). *Amer J Path* 57(3):617-625, 1969. 625, 1969.

Bile flow rates were measured at 4 and 24 hr after acute manganese overload (0.053 to 0.06 ml/100 g for 30 min) in Sprague-Dawley rats. A significant decrease in bile flow rate occurred 4 hr after manganese overload and was accompanied by dilatati of the canaliculi and abnormalities of the micro-i of the canaliculi. The decrease in bile flow disappeared after 24 hr but alterations in the liculi persisted. Manganese-induced cholestasis ingly results from an injury and/or abnormality er of walls of the canaliculi themselves or of bile within them.

BILIARY EXCRETION OF CONJUGATED SULFOBROMOPHTHALEIN SODIUM (BSP) IN RATS FED OTEIN-FREE DIET. *(E.)* Whelan, G. (U. Texas hwestern Med. Sch., Dallas), J. Hoch and B. es. *Proc Soc Exp Biol Med* 132(2):704-707, 1969.

biliary excretion of BSP was measured in female gue-Dawley rats fed a protein-free diet for 2 and given either free BSP or BSP conjugated glutathione and was compared with that of con- s fed a regular diet and given the same com- ds. The common bile duct was cannulated and s of 30 μmoles/100g body weight for conjugated and 18 μmoles/100g body weight for free BSP were n i.v. Bile volume was measured and BSP concen- ion was measured colorimetrically. When conju- d BSP was used the maximal rate of dye delivery the same in controls and in the rats fed protein- diets. The rats on protein-free diets had a de- se in the maximal rate of dye excretion when BSP was used. Impaired intrahepatic conjuga- of BSP seemingly is the mechanism by which BSP etion is diminished in rats fed protein-free s.

VITAMIN K AND THE SYNTHESIS OF FACTORS VII-X BY ISOLATED RAT LIVER CELLS. *(E.)* otra, G. S. (U. Oklahoma, Sch. Med. Oklahoma) and B. C. Johnson. *Proc Soc Exp Biol Med* 2):509-513, 1969.

effect of vitamin K on synthesis of factors X and the site of its action were investigated g isolated liver cell preparations (3-5 x 10^6 s/ml Tris buffer) from Sprague-Dawley rats. ensions of liver cells from normal control rats from vitamin K-deficient rats injected intra- ially with 1 mg vitamin K, 25 min prior to ifice, both produced factor VII-X activity for east 1.5 hr. Isolated cells from vitamin K- cient rats failed to produce such activity even vitamin K (1 mg/ml) was added *in vitro*. Sus- ed oxygen uptake (1.5 hr) was noted in liver s from the normal controls and from vitamin ficient rats. Both cycloheximide (1 mg/ml) and mycin (5 mg/ml) failed to block the formation actor VII-X activity in normal rats and in vita- K-deficient rats which were injected with vitamin ior to sacrifice. Puromycin (30 mg/100 mg), ad- stered *in vivo* simultaneously with vitamin K to vitamin K-deficient rats, inhibited production actors VII-X in the cell preparation. Warfarin 5 mg/10^6 cells) inhibited the formation of ors VII-X and inhibited oxygen uptake in cell ensions from control rats. Vitamin K probably tions beyond the site of puromycin block in the ation of active factors VII-X.

0823 ALTERATIONS IN THE SENSITIVITY TO EFFECTORS OF RAT LIVER ACETYL-CoA CARBOXYLASE FOLLOWING TRYPSIN TREATMENT. *(E.)* Iritani, N. (Kyoto U. Fac. Med., Japan), S. Nakanishi and S. Numa. *Life Sci* 8(22):1157-1165, 1969.

The effect of trypsin treatment on the activity of highly purified and partially purified acetyl-CoA carboxylase prepared from livers of Wistar rats fed a fat free diet for 48 hr was determined. The highly purified and partially purified enzyme preparations exhibited specific activities of 1.5 to 1.7 and 0.03 to 0.05 U/mg protein, resp. When highly purified enzyme (130 μg/ml) was preincubated (at pH 7.5, 25C) with potassium citrate (10 mM) and/or trypsin (4 μg/ml), there was considerable enzyme activity in every preparation. The activation provoked by trypsin was 30 to 50% of that provoked by citrate, and the effects of citrate and trypsin were almost additive. The trypsin-treated enzyme was less sensitive to the trypsin inhibitor palmityl-CoA than the control enzyme. At palmityl-CoA concentrations of 2 and 20 μM, the relative activities of the trypsin-treated carboxylase were 94 and 68%, resp.; and the relative activities of the control carboxylase were 68 and 34%, resp. Sucrose density gradient (5 to 20% gradient) centrifugation of partially purified acetyl-CoA carboxylase under varying conditions showed that the sediment coefficient of the enzyme was changed by trypsin treatment in correlation with the alterations in the sensitivity to effectors.

0824 COMPARATIVE *IN VIVO* STUDIES OF RNA SYNTHESIS IN THE FETAL LIVER, PLACENTA, AND MATERNAL LIVER. *(E.)* Hayashi, T. T. (Pittsburgh U. Sch. Med., Magee--Womens Hosp., Pa.), D. H. Shin and S. Wiand. *Amer J Obstet Gynec* 105 (8):1261-1268, 1969.

Simultaneous labeling of fetal liver, placenta and maternal liver RNA was measured in pregnant (20 days) rats. Following i.p. injection of 50 to 100 μc of the labeled precursor (^{14}C-orotic acid or ^{14}C-uridine), the RNA was extracted at specified intervals by cold phenol technique and was analyzed by sucrose gradient centrifugation. The ^{14}C-orotic acid was readily incorporated into all the RNA of all three tissues, with the highest radioactivity in fetal liver, followed by placental RNA. The ^{14}C-uridine was incorporated only into the fetal liver and the placental RNA. Labeled RNA isolated from placentas of 20-day pregnant rats, 12 hr after injection of the isotopes, showed unusually reduced or absent 18S radioactivity peak associated with a normal absorbency pattern. There appears to be a preferential turnover of 18S placental RNA synthesized during late gestation in rats.

0825 INFLUENCE OF HEPARIN ON THE REMOVAL OF SERUM LIPOPROTEIN LIPASE BY THE PERFUSED LIVER OF THE RAT. (E.) Naito, C. (1st Dept. Intern. Med., U. Tokyo, Japan) and J. M. Felts. *J Lipid Res* 11(1):48-53, 1970.

Isolated rat livers were perfused with whole rat blood containing postheparin lipoprotein lipase activity, to evaluate the role of the liver in removing lipoprotein lipase activity in conditions of increasing heparin concentrations. Lipoprotein lipase activity disappeared rapidly from the perfusate and was not related to non-specific activation or to release of an inhibitor by the liver. Heparin (4 units/ml) added to the perfusate, almost completely blocked the disappearance of lipoprotein lipase activity. Heparin, added to an assay system containing fresh post-heparin rat serum, stimulated lipoprotein lipase activity by 70%. When heparin was added to post-heparin serum which was perfused through the liver, it stimulated lipoprotein lipase activity by 200%, but did not restore lipoprotein lipase activity to its perfusion value a two step inactivation system for lipoprotein lipase by the liver may involve first, a dissociation of a heparin-apoenzyme complex and destruction of heparin, followed by the removal of the apoenzyme of lipoprotein lipase.

0826 THE USE OF PHENOBARBITAL AND CARBON TETRACHLORIDE TO EXAMINE LIVER PHOSPHOLIPID EXCHANGE IN INTACT RATS.

(E.) Wirtz, K. W. A. (Div. Biol. Sci., Cornell U., Ithaca, N. Y.) and D. B. Zilversmit. *Biochim Biophys Acta* 187(4): 468-476, 1969.

The exchange of phospholipids *in vitro* between mitochondria and microsomes of the rat liver was studied to determine if this process could take place in the intact organism. ^{32}P was injected into rats pretreated with phenobarbital or carbon tetrachloride and 30 to 60 min later liver mitochondria and microsomes were isolated. Phenobarbital treatment resulted in an expansion of the microsomal phospholipid pool and a decrease in the specific activities of phosphatidyl choline and phosphatidyl ethanolamine in both microsomes and mitochondria. Treatment with carbon tetrachloride had no effect on phospholipid pool size but did increase specific activities of microsomal and mitochondrial phosphatidyl ethanolamine. The ratios of mitochondrial phospholipid specific activities to microsomal phospholipid specific activities were similar in treated and control animals. Newly synthesized [^{32}P] phospholipids apparently distribute themselves over mitochondria and microsomes according to the relative pool sizes in a manner compatible with *in vivo* phospholipid exchange mechanisms of the cell.

0827 EFFECTS OF HYPOPHYSECTOMY, ADRENELECTOMY, CHOLESTEROL FEEDING, AND PUROMYCIN ON THE RADIATION-INDUCED INCREASE IN HEPATIC CHOLESTEROL BIOSYNTHESIS IN RATS.

(E.) Gould, R. G. (Stanford U. Sch. Med., Palo Alto, Calif.), V. B. Kojola and E. A. Swyryd. *Radiat Res* 41(1):57-69, 1970.

In vivo incorporation of acetate-1-^{14}C into liver cholesterol in adrenalectomized male Sprague-Dawley rats was increased by 20% and 8.5% after 24 and 48 hr fast, resp.. Incorporation was increased 8-fold 24 hr after whole body X-irradiation (2400 R
and to a greater extent after 48 hr, and the in-
crease was not affected by adrenalectomy. Hypoph
sectomy decreased incorporation of acetate-1-^{14}C
into liver cholesterol to very low levels in fast
rats and prevented the marked increase in incorpo
tion produced by irradiation (300-2400 R). X-ir-
radiation (2400 R) increased hepatic cholesterol
biosynthesis 5- to 7-fold and decreased hepatic
levels of esterified cholesterol in rats fed a 1%
cholesterol diet. Puromycin decreased hepatic
protein synthesis but not cholesterol synthesis i
non-irradiated rats and decreased hepatic cholesterol synthesis in irradiated [1490 R) rats.

0828 STUDIES ON HEPATOXICITY INDUCED BY CHLORINATED HYDROCARBONS: LIPID AND ATP METABOLISMS IN THE LIVER OF MICE EXPOSED TO 1,1,2,2-TETRACHLORETHANE.

(E.) Tomokuni, K. (Okayama Med. Sch., Japan). *Acta Med Okayamam* 23(4):273-282, 1969.

Total lipid, trigylceride and ATP levels in the
liver were determined in female mice before and
0, 4 and 8 hr after exposure to 1,1,2,2-tetra-
chloroethane (600±50 ppm) for 3 hr. Total trigly
ceride and lipid levels increased almost linearl
throughout the 8 hr period (518% and 216% of the
control value, resp., after 8 hr) In contrast,
hepatic ATP levels decreased remarkably during e
posure. At 0, 4 and 8 hr. after exposure, the A
levels were 75%, 59% and 46% of the control valu
resp. The values of total lipid times ATP befor
exposure and at 0, 4 and 8 hr after exposure wer
41, 35, 37 and 41, resp., indicating that there
is an almost parallel relation between the increase in total lipids and the decrease in ATP.
The degree of hepatotoxicity induced 1,1,2,2-
tetrachloroethane was almost identical to that o
carbon tetrachloride.

0829 (Mg^{2+}-Na^+-K^+)-ATPASE ACTIVITY OF LIVER FROM TUMOR BEARING RATS.

(E.) Rubenst
B. (Cancer Res. Unit, McGill U., Montreal Quebec
Canada). *Biochim Biophys Acta* 191(3):760-762, 1

A method is described for reducing the contribut
of Mg^{2+} in the (Mg^{2+}-Na^+-K^+)-dependent ATPase in
rat liver in order to examine the kinetics of th
Na^+ and K^+ interaction. Livers from Sprague-Daw
rats with the ascitic form of Novikoff hepatoma
were homogenized and centrifuged at 10,000 x g f
10 min. Sodium citrate (pH 4.1) was added to th
supernatant, which was centrifuged for 10 min at
6000 x g and the sediment was resuspended in
10 ml of water. The basic reaction mixture contained 0.5 ml protein precipitate (pH 4.1), 6.0
ATP, 60 mM Tris (pH 7.8) and 1.8 M urea in a fin
volume of 3.0 ml. Na^+, K^+, Ca^{2+}, Mg^{2+} and ouaba
were added in various combinations at 37 C. ATP
activity in the presence of Mg^{2+} was further sti
lated by the addition of both Na^+(120 mM) and K^+
(6.0 mM), but neither ion had much effect along.
Ca^{2+} (6.0 mM) could not substitute for Mg^{2+} in t
(Na^+-K^+)-ATPase system. Ouabain partially inhib

complete system, but not the system with only
. Urea decreased the Mg^{2+}- but not the Na^+- or
imulated activity. Increasing the temperature
5 C in the presence of urea inhibited the Mg^{2+}-
ulated ATPase activity. The system gives a ra-
of Mg^{2+}-Na^+-K^+ activity to Mg^{2+} activity of 4.5.
the effect of Na^+ concentration on the system
examined, ATPase activity reached a maximum at
$^+/K^+$ ratio of 16. The inhibition of ATPase ac-
ty with a higher concentration of Na^+ was in-
igated over the range of 12 to 12 mM. The lin-
relationship of the inhibition indicates that
site of Na^+ is probably the same as that in-
ed in the activation by K^+.

HEPATOCYTIC PROLIFERATION IN NORMAL RATS AFTER MULTIPLE EXCHANGE TRANSFUSIONS
BLOOD FROM PARTIALLY HEPATECTOMIZED RATS. *(E.)*

nam, J.W. (Washington U. Sch. Med., St. Louis,
. *Cell Tissue Kinet* 2(4):277-282, 1969.

ecutive exchange transfusions (75 to 85% washout
lood) were performed on male Wistar albino rats
intact livers, utilizing blood from rats par-
ly hepatectomized (two-thirds resection) 24 hr
ier or from sham operated controls. One hr be-
sacrifice and 20 hr after the first infusion,
were injected i.v. with ^{3}H-thymidine (1.0 μC/g
ml normal saline) to label liver DNA and nu-
. When 1 to 4 exchange transfusions using blood
the sham-operated rats were performed, there
no significant change in the incorporation of
led thymidine into liver DNA. One or 2 ex-
ge transfusions with blood from partially hepa-
omized rats likewise did not affect thymidine
rporation, but 3 or 4 exchange transfusions
ificantly elevated the incorporation. Labeling
ittoral cell nuclei was not significantly af-
ed by 3 or 4 exchange transfusions with blood
partially hepatectomized rats, but the label-
of hepatocyte nuclei increased with each
sfusion. To investigate time parameters of
tocytic stimulation, rats transfused 3 times
killed at either 10 or 20 hr following the
t transfusion. At 20 hr, but not at 10 hr, in-
oration of thymidine was significantly in-
sed.

EFFECT OF A COMBINATION OF B COMPLEX VITAMINS AND ASCORBIC ACID ON LIVER LIPID
ENT IN RATS INTOXICATED WITH ETHYL ALCOHOL.

Moretti, A. (Inst. Res., Milan, Italy), C.
i and G. K. Suchowsky. *Arzneimittelforschung*
)):1742-1743, 1969.

Sprague-Dawley rats were divided into 2 major
s, one drinking a solution of sucrose prepared
rovide isocaloric replacement of the 10% (w/v)
l alcohol imbibed by the other group. Both
e groups were subdivided into 2 groups, each
isting of 10 to 12 rats which received daily
injections of either solvent (control) or
griseovit (vitamin B_{12}, nicotinamide, folic
and ascorbic acid). After 2-1/2 months, the
l alcohol had induced a 48% increase of tri-
erides in rat liver, from 12.42 mg/g in the
controls to 18.32 mg/g. Daily treatment of ethanol-drinking rats with Epargriseovit reduced the level of hepatic triglycerides to 13.98 mg/g, a value not significantly different from the controls. Neither phospholipids nor cholesterol changed significantly following the various treatments. The protective action of the B complex vitamins against fatty liver appears to be exerted regardless of the agent which induced it.

0832 REGULATION OF LIVER TYROSINE AMINOTRANSFERASE BY ENDOGENOUS FACTORS IN THE MOUSE.

(E.) Finch, C. E. (Rockefeller U., N.Y., N.Y.), H. S. Huberman and A. E. Mirsky. *J Genl Physiol* 54(6):675-689, 1969.

The effect of cold and shaking on liver tyrosine aminotransferase activity (expressed per unit DNA) was investigated in C57Bl/6J male mice fasted for 20 hr. Exposure to cold (1 to 10 C) caused a rapid increase of tyrosine aminotransferase activity at a rate of 0.04 tyrosine aminotransferase/DNA/hr. Actinomycin D (2 mg/100 g in 0.14 M NaCl), injected i.p. 15 min prior to exposure to 9 C, almost completely inhibited the increase in tyrosine aminotransferase activity. Tyrosine aminotransferase activity returned to basal levels a few hr after exposure to cold (2 C or 9 to 10 C, for 45 or 90 min). When mice were recently fed (12 hr postprandially), there was no induction of tyrosine aminotransferase activity after 120 min of exposure to cold. Injection of insulin (0.75 IU/100 G, i.p.) 12 hr postprandially caused a large induction of tyrosine aminotransferase activity. Actinomycin D (2 mg/100 g) did not affect survival at 2 C. When caged fasted mice were placed on a reciprocating shaker (180 excursions/min) for 30 min, there was an increase in tyrosin aminotransferase activity comparable to that seen after exposure to cold. Actinomycin D (2 mg/100 g) almost completely inhibited the increase of tyrosine aminotransferase activity. The basal level of tyrosine aminotransferase activity was nearly regained 180 min after the experiment began.

0833 PYRROLIDONECARBOXYLYL PEPTIDASE FROM RAT LIVER. *(E.)*

Armentrout, R. W. (Inst. Bacteriol, Karolinska Inst., Stockholm, Sweden). *Biochim Biophys Acta* 191(3):756-759, 1969.

Pyrrolidonecarboxylyl peptidase (which specifically removes pyrrolidonecarboxylyl residues from large proteins as well as small peptides) was isolated and purified from a strain of *Pseudomonas fluorescens* and compared with pyrrolidonecarboxylyl peptidase prepared and purified from rat liver. There are no radical differences in the purification behavior of the rat liver and the bacterial enzyme. The two enzymes both appear to contain sulfhydryl groups, requiring a reducing environment, and both are stabilized and reversibly inhibited by 2-pyrrolidone. Relative rates of hydrolysis of three representative dipeptides imply similarities between the pyrrolidonecarboxylyl peptidase from the two sources. Specificity of the enzyme from the two sources is shown in that the rat liver enzyme very efficiently removes the pyrrolidonecarboxylyl residue from a natural peptide of 21 residues without detectable damage to the remainder of the molecule. The rat liver pyrrolidonecarboxylyl peptidase may have a role in the initiation of protein synthesis in mammalian cells, including rat liver.

0834 DECREASED MONOAMINE OXIDASE ACTIVITY IN LIVER OF IRON-DEFICIENT RATS. *(E.)*

Symes, A. L. (Dept. Biochem., McGill U., Montreal, Canada), T. L. Sorkes, M. B. H. Youdim, G. Gregoriadis and H. Birnbaum. *Canad J Biochem* 47(11):999-1002, 1969.

Monoamine oxidase activity was decreased by 18 to 31% in the liver mitochondria of rats fed an iron-deficient diet for 5 weeks. Chemicals known to chelate iron (α,α'-dipyridyl, 8-hydroxyquinoline, α-phenanthroline) inhibited monoamine oxidase activity (measured by inhibition of oxidation of tyramine and isoamylamine) in normal rat liver preparations *in vitro*. Monoamine oxidase activity was not decreased in the liver mitochondria of rats fed a copper-deficient diet but liver copper and plasma ceruloplasmin levels were decreased. Iron appears to be an important factor in determining the activity of liver monoamine oxidase.

0835 EARLY EFFECTS OF CARBON TETRACHLORIDE ON THE SYNTHESIS OF PHOSPHOLIPIDS IN THE RAT LIVER AND THEIR POSSIBLE PATHOGENETIC ROLE IN FATTY LIVER INDUCTION. *(E.)*

Halbreich, A. (Dept. Biochem., Hebrew U., Hadassah Med. Sch., Jerusalem, Israel) and J. Mager. *Biochim Biophys Acta* 187(4): 584-587, 1969.

Intraperitoneal injections of carbon tetrachloride (0.02 ml/100 gm body weight), in 0.3 ml paraffin oil, were administered to rats, followed in 20 min by injections of a mixture of 2 μC L-[I-^{14}C] leucine (0.5 μ mole) and 0.5 μC[I-^{14}C] choline chloride (0.01 μ mole). Rats were sacrificed 10 min after labeled compounds were injected and livers were pooled and homogenized for microsomal determinations. The small dose of carbon tetrachloride markedly decreased the incorporation of [^{14}C] choline into phospholipids and [^{14}C] leucine into proteins by rat liver microsomes, as first revealed 10 to 15 min following the second injection, and continuing for at least 20 hr. These results were confirmed by radioactivity determination of unfractionated liver homogenates and by thin-layer chromatography. Ethionine and the necrogenic agent, dimethylnitrosamine, failed to significantly affect the incorporation of choline into liver phospholipids, although both compounds had an inhibitory effect on protein synthesis.

0836 EFFECT OF ETHANOL ON FATTY ACID COMPOSITION OF HEPATIC PHOSPHATIDYLCHOLINE AND PHOSPHATIDYLETHANOLAMINE AND ON MICROSOMAL FATTY ACYL-COA:LYSOPHOSPHATIDE TRANSFERASE ACTIVITIES IN RATS FED CORN OIL OR COCONUT OIL. *(E.)*

Mendenhall, C. L. (V. A. Hosp., Indiana U. Med. Ctr., Indianapolis), R. H. Bradford and R. H. Furman. *Biochim Biophys Acta* 187(4):510-519, 1969.

The effect of ethanol on fatty acyl-CoA:lysophosphatidylcholine and fatty acyl CoA:lysophosphatidylethanolamine transferase activity in liver microsomes was studied in untreated control, and ethanol-treated male Holtzman rats receiving diets of corn oil (18% fat in total calories) for 46 days, coconut oil as a sole source of fat for 46 days, corn oil formula for 42 days and coconut oil for 4 days. At the end of the experiment more unsaturate fatty acid was present in hepatic triglyceride, phosphatidylcholine and phosphatidylethanolamine i rats fed corn oil, and ethanol administration to corn-oil fed rats increased fatty acid concentratio in hepatic triglyceride and phosphatidylcholine, bu not in phosphatidylethanolamine. In coconut oil-fe rats, ethanol increased the relative amounts of saturated fatty acid solely in hepatic triglycerid Ethanol administration in corn oil-fed rats markedl decreased the transfer of unsaturated and saturate fatty acids onto α-lysophosphatidylcholine and ont β-lysophosphatidylcholine, respectively. No similar transfer decrease was observed in ethanol-treated rats fed coconut oil formula. Ethanol slightly increased the transfer rates of both saturated and unsaturated fatty acids onto α-lysophosphatidylethanolamine in corn oil-fed rats, but had little effect on transfer of fatty acids onto β-lysophosphatidylethanolamine.

0837 EFFECT OF ETHANOL ON GLYCEROLIPID METABOLISM IN RAT LIVER. *(E.)*

Mendenhall, C. L. (VA Hosp., Indiana U. Med. Ctr., Indianapolis), R. R. Bradford and R. H. Furman. *Biochim Biophys Acta* 187(4):501-509, 1969.

The effect of chronic ethanol administration on r liver biosynthesis, measured by incorporation of radioactive glycerol into triglyceride, phosphatidylcholine and phosphatidylethanolamine, was studied in Holtzman rats on a weight-maintained liqui diet. Ethanol administration to rats for 4 to 6 weeks increased the hepatic triglyceride concentra tion by 5-fold, and increased esterified choleste ol by more than 10-fold. Significant increases i hepatic phosphatidylcholine (138% of control), phosphatidylethanolamine (126%) and sphingomyelin (179%) were obtained, as well as similar increases of these hepatic lipids in serum from ethanol-treated rats. Measurements of half-time values f hepatic glycerolipids, using [^{3}H] glycerol, showe that ethanol administration increased the absolut turnover rate (mg/day) of each glycerolipid: triglyceride to 122% of control; phosphatidylcholine, 116%; and phosphatidylethanolamine, 110%. T functional turnover rates (percent/day) of triglyceride and phosphatidylcholine were lower in ethanol-treated rats than in controls. The accumulation of glycerolipids in the livers of ethanol-treated rats is probably due to a relatively greater increase in their rates of synthesis than in their rates of removal.

8 INFLUENCE OF THYROID FUNCTION ON THE
ACETALDEHYDE LEVEL OF BLOOD AND LIVER OF
ACT RATS DURING ETHANOL METABOLISM. *(E.)*

sander, O. A. (Res. Lab. State Alcohol Monopoly
ko], Helsinki, Finland), M. E. Hillbom and K. O.
dros. *Acta Pharmacol (Kobenhavn)* 27(6):410-416,
9.

els of acetaldehyde and the lactate/pyruvate ra-
were estimated in the intact liver, in hepatic
ous blood, and in peripheral blood of untreated,
iodothyronine-treated or propylthiouracil-
ated Wistar rats following ethanol administra-
n. During ethanol oxidation, lactate and pyru-
e levels and lactate/pyruvate ratio were simi-
in hepatic venous blood and in the liver, and
e markedly lower in fasted rats than in fed rats.
lactate concentrations were found in triiodo-
ronine-treated rats after fasting, and the pyru-
e level was low in all groups. In both fed and
ted rats given ethanol, the lactate/pyruvate
centration ratio was higher in propylthiouracil-
ated rats, and lower in triiodothyronine-treated
s, as compared with untreated controls. The
taldehyde levels were lower in starved than in
rats, and lower in both hyperthyroid and hypo-
roid rats than in normal rats. No correlation
found between acetaldehyde levels and the redox
te of the liver.

9 THE OCCURRENCE OF SUBSTANCES IN HUMAN
PLASMA CAPABLE OF INDUCING THE ENZYME δ-
NOLEVULINATE SYNTHETHASE IN LIVER CELLS. *(E.)*

pas, A. (Rockefeller U., N.Y., N.Y.), C. S.
e, S. Sassa, R. D. Levere and S. Granick. *Proc
Acad Sci USA* 64(2):557-564, 1969.

ubstance which strongly induced the synthesis of
phyrins in primary cultures of chick embryo
er cells was demonstrated in the plasma of 5 pa-
nts with acute intermittent porphyria not in the
sma of 60 normal control subjects or 28 porphy-
patients in remission. Significant inducing
ivity was found in the plasma of 8/13 normal
en ingesting contraceptive steroid hormones.
induction response of the humoral agent in the
um of porphyric patients was similar to that e-
ited by drugs and hormones which enhance porphy-
production by inducing formation of the rate-
iting enzyme δ-aminolevulinate synthetase. The
urrence of this porphyrin-inducing hormone may
of clinical significance in genetically suscep-
le individuals, and permits a chemical charac-
ization of humoral agents which may be related
episodic exacerbations of this hereditary liver
ease.

0 EFFECT OF CO_2 CONCENTRATION ON INTRACEL-
LULAR pH AND ON GLYCOGEN SYNTHESIS FROM
CEROL AND GLUCOSE IN ISOLATED PERFUSED RAT
ER. *(E.)*

Longmore, W. J. (St. Louis Sch. Med.,
), C. M. Niethe and M. L. McDaniel. *J Biol Chem*
(23):6451-6547, 1969.

effect of variation of extracellular total CO_2 concentration (at a constant pH) on intracellular pH, on total intracellular CO_2 content and on conversion of glycerol-1,3-^{14}C and labeled glucose to glycogen was studied in perfused rat liver. Perfusate CO_2 concentration was varied from 8 to 40 mM and pH was held constant between 7.4 and 7.5. After 60 min of perfusion with either CO_2 concentration, the intracellular pH remained constant at a range of 7.0 to 7.1. Intracellular CO_2 content followed changes in extracellular CO_2 content, but was generally 25% lower. Liver glycogen content was increased 30 to 60% and glycerol-1,3-^{14}C conversion to glycogen increased 90 to 100% by perfusion with an average total CO_2 concentration of 33 mM, as compared to 9 mM total CO_2, in the presence of 13 mM glycerol and 15 mM glucose as substrate. When glucose, adjusted to 5.6 mM, was the only added substrate, glycogen content was not markedly altered. Conversion of ^{14}C-labeled glucose to glycogen was increased 90% over control values when liver perfusate in the first hr of perfusion contained 11 mM of CO_2, followed in the second hr by 34 mM of CO_2. Variations in the extracellular CO_2 concentration within physiological limits does not appear to alter glycogen metabolism by variation of total intracellular CO_2 concentration, nor by variation of intracellular pH. Total intracellular CO_2 concentration may be a physiological regulator of carbohydrate metabolism.

0841 EFFECTS OF BILIRUBIN ON MITOCHONDRIAL REACTIONS. *(E.)*

Mustafa, M. G. (Dept. Chem., State U. New York, Albany, N. Y.), M. L. Cowger and T. E. King. *J Biol Chem* 244(23): 6403-6414, 1969.

The effects of bilirubin on respiration, respiratory control, oxidative phosphorylation, and swelling of mitochondria from rat liver, bovine heart, and brain of chick, rabbit, and monkey were studied. Low (<~20 μM) concentrations of bilirubin increase and high concentrations (>50 μM) decrease the respiration of liver or heart mitochondria but not that of brain mitochondria, in which respiration is always inhibited by bilirubin. Bilirubin in micromolar concentrations abolishes respiratory control, uncouples oxidative phosphorylation, and induces swelling of mitochondria. The bilirubin-induced swelling is irreversible, has a large amplitude, and requires a monovalent cation, any permeable anion, Mg^{++}, and energy (may be supplied from the oxidation of a substrate by the respiratory chain or from external ATP). Swelling, measured by the decrease of absorbance at 590 mμ, is parallel to the increase of water content and packed volume of mitochondria, and is also accompanied by proton ejection to the medium. When ATP is used as an energy source, liberation of inorganic phosphate follows the pattern of swelling with a short initial lag. The K_m value (50% of the maximum) of bilirubin for the overall swelling is about 2.5 μM in liver mitochondria and is approximately 2 μM (about 0.1 mg of bilirubin per 100 ml) in brain mitochondria. Bovine serum albumin prevents uncoupling and swelling; estimation from the titration curves for either process gives a molar ratio of 1 for bilirubin to albumin.

0842 THE INFLUENCE OF LIGHT ON DAILY RHYTHM IN HEPATIC DRUG METABOLIZING ENZYMES IN RATS.

(E.) Nair, V. (Michael Reese Hosp., Chicago, Ill.) and R. Casper. *Life Sci* 8(23):1291-1298, 1969. Chicago, Ill. 60616) and R. Casper. *Life Sci* 8(23): 1291-1298, 1969.

Activities of two drug-metabolizing enzymes (hexobarbital oxidase and p-nitroanisole-O-demethylase) were determined in the livers of rats exposed daily to various schedules of light and darkness for 2 weeks. In rats exposed to alternating periods of light and darkness, both enzymes showed a diurnal rhythm, characterized by maximal activity at 10 P.M. and minimal activity at 2 P.M. for hexobarbital oxidase and maximal activity at 2 A.M. and minimal activity at 6 P.M. for p-nitroanisole-O-demethylase. Continuous exposure to either light or darkness abolished the daily rhythm for both enzymes, indicating that daily rhythm is at least partly exogenous and is dependent on the cycle of environmental lighting.

0843 CHARACTERIZATION OF THE FATTY ACID ELONGATION SYSTEM IN SOLUBLE EXTRACTS AND MEMBRANE PREPARATIONS OF RAT LIVER MITOCHONDRIA. *(E.)*

Colli, W. (Publ. Hlth. Res. Inst., New York, N. Y.), P. C. Hinkle and M. E. Pullman. *J Biol Chem* 214(23):6432-6442, 1969.

The fatty acid elongation system and other aspects of fatty acid biosynthesis were studied in submitochondrial particles (or their Triton extracts) prepared from rat liver mitochondria. These particles or their Triton extracts incorporate 1-^{14}C-acetyl-CoA into fatty acids in presence of ATP and NADPH or NADH. (NADPH is 25% as active as NADH and NADPH may also be a direct reductant in the elongation system). ATP supports acetyl-CoA incorporation by activating endogenous fatty acids via an acyl-CoA synthetase-catalyzed reaction. Radiocarbon and gas-liquid chromatographic analyses of the synthesized products were consistent with the operation of a chain elongation mechanism. The fatty acid products of the reaction were identified as CoA esters, 2 to 4 carbon atoms longer than primer fatty acyl-CoA. The elongation reaction was found in both inner and outer mitochondrial membranes as well as in the soluble fraction and the inner membrane preparations were 10 times more active with decanoly-CoA than palmitoyl-CoA, but outer membrane preparations were only 1.5 to 3 times more active with palmitoyl-CoA.

0844 COMPARISON OF *IN VIVO* AND *IN VITRO* EFFECTS OF CHLOROQUINE ON HEPATIC LYSOSOMES. *(E.)*

Filkins, J. P. (U. Tennessee Med. Units, Memphis). *Biochem Pharmacol* 18(11):2655-2660, 1969.

The acute influence of chloroquine on rat hepatic lysosomes was studied *in vivo* as well as in the isolated perfused liver, liver slices, liver homogenates and large granule fractions of male Holtzman rats. Lysosomal changes were measured by analys
of free and total hydrolytic activities of acid
glycerophosphatase and β-glucuronidase. Moderat
to marked lysosomal hydrolase alterations, manifested by increased free enzyme activities were
served when chloroquine was administered *in viv*
i.p. at 1 to 25 mg/kg. Following i.p. injectio
chloroquine (10 mg), elevations of free hydrola
were observed by 30 min, reached maximum values
2 to 4 hr, and returned to normal at 24 hr. Ch
roquine (10 mg) administered to isolated perfus
livers produced marked increases in activities
both acid phosphatase and β-glucuronidase when
sayed 60 min after addition to perfusate. No s
nificant increases in free activities of acid
hydrolases was induced by chloroquine in liver
homogenate or large granule fractions. Acute
treatment with chloroquine *in vivo* produced lys
mal hydrolase alterations which are indicative
cell-mediated "labilization".

0845 SECRETION OF BILE IN THE RABBIT: EVID IN FAVOR OF A MAJOR FRACTION INDEPEND OF THE BILE SALTS. *(Fr.)*

Erlinger, S. (Beaujon
Hosp., Clichy, France), D. Dhumeaux, J. P. Benh
and R. Fauvert. *Rev Franc Etud Clin Biol* 14(2)
144-150, 1969.

Bile flow, bile acid concentration and excretio
relations were studied after i.v. infusion of N
of deoxycholic acid in rabbits with cystic duct
ligation and common duct cannulation. Bile flo
after an initial decrease, remained stable and
salt concentration and excretion rate decreased
after NaCl infusion. Bile flow, bile acid conc
tration and excretion rate increased after infu
of deoxycholic acid. Bile flow was linearly pr
portional to bile salt excretion rate following
both NaCl and deoxycholic acid infusion.

0846 ACTIVE TRANSPORT OF TERTIARY AMINE CO POUNDS INTO BILE.

Nayak, P. K. (Natl
Heart Inst., Natl. Inst. Hlth., Bethesda, Md.)
L. S. Schanker. *Amer J Physiol* 217(6):1639-164
1969.

Biliary excretion of chloroquanide-triazine, di
ridamole, quinine and procaine amide, administe
i.v., was determined in rats with cannulated bi
ducts and ligated renal pedicles. All tertiary
amines readily appeared in the bile in concentr
tions higher than in plasma. During a 90 min p
injection period, chloroquanide-triazine (0.04
mg/kg) showed a bile-to-plasma ratio of 26 to 4
dipyridamole (25 mg/kg) a ratio of 44 to 54,
quinine (25 mg/kg) a ratio of 21 to 24, and pro
caine amide (25 mg/kg) a ratio of 3 to 7. The
centage of an injected dose recovered in the bi
during 90 min ranged from 0.3 for procaine amid
7.3 for chloroquanide-triazine. The biliary ex
tion of chloroquanide-triazine and procaine ami
was decreased by tertiary and quaternary amines
Tertiary amines are actively transported from p
ma into bile and the transport process seeming
the same as that which transports certain quate
ry ammonium compounds into the bile.

47 SYNTHESIS OF PHOSPHOLIPIDS AND TRIGLYCERIDES IN HUMAN LIVER SLICES. I. EXPERI-
ITAL CONDITIONS AND THE SYNTHESIS RATE IN NORMAL
/ER TISSUE. *(E.)* Nilsson, S. (Dept. Surg., U.
:eborg, Sweden) and T. Schersten. *Scand J Clin*
Invest 24(3):237-249, 1969.

ospholipid and triglyceride synthesis was studied
normal liver slices (from fasting subjects) in-
ated with glycerol-1,3-^{14}C or fructose-U-^{14}C.
ut 50% of the glycerol label was incorporated
o glucose, 10 to 15% into CO$_2$ and lipids, and
s than 1% into glycogen and acetate. When the
ty acid concentration in the incubation medium
increased, the incorporation of glycerol label
o CO$_2$ and glucose was decreased, into triglyc-
des was increased, and into phosolipids was un-
nged. The incorporation of fructose label into
glycerides was greater than, into phospholipids
less than, and into diglycerides was the same
the incorporation of glycerol label. The incor-
ation of fructose label into triglycerides and
spholipids was inhibited by the presence of
cerol in the medium. The mean synthesis rate
phospholipids was 0.14 ± 0.01 µmoles/g liver/hr
for triglycerides was 0.34 ± 0.04 µmoles/g
er/hr. Synthesis of phospholipids was not posi-
ely correlated to the synthesis of triglycerides
the liver and there were no sex differences for
synthesis of phospholipids and triglycerides.

8 THE POTENTIATION BY AMITRIPTYLINE OF LIVER CHANGES INDUCED BY ETHANOL IN MICE.
) Milner G. (Roy. Perth Hosp., Australia) and
A. Kakulas. *Pathology* 1(2):113-118, 1969.

gle p.o. doses of amitriptyline (50 mg/kg) or
anol (25 ml/kg of 25% solution) produced slight
moderate fatty changes in the liver of mice.
bined administration of amitriptyline and eth-
l produced severe fatty changes which were sug-
tive of no residual reserve of liver function.
uolation (possibly due to glycogen or fat) was
sent in hepatocytes of all mice treated with
triptyline plus ethanol and was most severe in
e which suffered late deaths.

9 EXERCISE TOLERANCE OF COLD-ACCLIMATED RATS: SERUM AND LIVER ENZYMES AND HISTO-
ICAL CHANGES. *(E.)* Dieter, M. P. (Nat. Insts.
n., Bethesda, Md.), P. D. Altaland and B. Highman.
ad J Physiol Pharmacol 47(12):1025-1031, 1969.

e Sprague-Dawley rats (114 animals) were kept at
n temperature (25C) or in a cold room (1.7C)
4 to 6 weeks and were than exercised (cylindri-
cage) for 5 or 9 hr at room temperature. Cold-
limated rats tolerated 5 hr exercise, but 1/3 of
n died during 9 hr exercise. The increased met-
lic demands of thermoregulation combined with
se of prolonged exercise resulted in this high mortality. There were no deaths among room temperature controls. Nine hr exercise resulted in significantly greater elevations in serum glutamic pyruvic transaminase, lactic dehydrogenase, and malic dehydrogenase, in cold-acclimated rats. Except for serum glutamic pyruvic transaminase, the activities returned to control levels within 2 days. The tissue enzyme changes after 9 hr exercise of cold-acclimated rats were generally less than in unacclimated rats. Liver lactic dehydrogenase and α-glycerophosphate dehydrogenase activity in unacclimated rats increased significantly above that of cold-acclimated rats 2 to 3 days after exercise. The decreases in hepatic glycogen and blood glucose after exercise were greater in cold-acclimated rats, and restoration of blood glucose levels occurred more slowly. These biochemical changes were not correlated with a greater increase in plasma corticosterone or a higher incidence of fatty visceral changes or muscle necrosis in cold-acclimated rats. Usually the homeostatic mechanisms available to singularly stressed rats appear to be exhausted in dually stressed ones. The loss of tissue enzymes to the serum and failure of tissue enzymes to repond to exercise stimulation undoubtedly contributed to the reduced exercise tolerance of cold-acclimated rats.

0850 THE EFFECT OF STARVATION ON THE INCORPORATION OF PALMITATE INTO GLYCERIDES AND PHOSPHOLIPIDS OF RAT LIVER HOMOGENATES. *(E.)* Vavrecka, M. (Cancer Res. Lab., U. Western Ontario, London, Canada), M. P. Mitchell and G. Hubscher. *Biochem J* 115(2):139-145, 1969.

Liver homogenates of female C.F.E. rats (180 to 240 g), fed ad libitum or starved for 36 to 40 hr, were used to determine whether or not starved rats showed a change in the activity of the enzymes catalyzing the glyceride biosynthesis from glycerol phosphate and (1-^{14}C) palmitate. The most significant parameter to which changes in enzyme activities should be related was found to be the total DNA content (equivalent to total liver homogenate). There was a slight but significant decrease in the amount of palmitate incorporated into total lipids with starved rats. Although the amount of palmitate incorporated into glycerides was nearly unchanged, the amount incorporated into phospholipids decreased to between 34 to 44% of the values with fed rats. Over 80% of the palmitate incorporated into total phospholipids was in phosphatidate (influenced only slightly by starvation). The ratio of labeled palmitate in triglycerides/diglycerides increased with starved rats only from 0.7 to 1.0. Addition of particle-free supernatant to full homogenates increased the total incorporation of palmitate by 45%. In starvation, the phosphatidate phosphohydrolase activity per total liver was increased 130 to 190%, and the specific activity 180 to 320% of the values for fed rats. The alteration of the incorporation pattern suggested that phosphatidate phosphohydrolase may be rate-limiting in the biosynthesis of glycerides via the glycerol phosphate pathway.

0851 ACTIVITY OF GLUCOSE PHOSPHORYLATING ENZYMES IN RAT LIVER IN EARLY STAGES OF CANCEROGENESIS. *(Ukr.)* Rubenchik, B. L. (Minis. Publ. Hlth., Kiev, USSR) and M. B. Pliss. *Ukr Biokhim Zh* 41(5):493-497, 1969.

The activity of glucose phosphorylating enzymes in the liver was studied in rats 2, 10, 18 and 24 weeks after injection with cancerogenic p-dimethylaminoazobenzene. A sharp increase in the total activity of glucose phosphorylation in homogenate, hyaloplasm and mitochondria was noted only in the later stages of cancerogenesis when liver tumors were already forming in the rats. Hexokinase activity in the hyaloplasm increased significantly, but the affinity of this enzyme for glucose (K_M) and sensitivity to the inhibitor ADP, as well as glucokinase, did not change during cancerogenesis.

0852 ENZYMES IN HUMAN BILE. I. EFFECTS OF GALLBLADDER BILE ON ENZYME ACTIVITY. *(Ger.)* Lorentz, K. (Med. Acad., Lübeck, Germany). *Enzym Biol Clin* 10(6):521-527, 1969.

Deproteinized human gallbladder bile strongly inhibited the activities of alkaline phosphatase, glutamic-oxalaoacetic-transaminase, glutamic-pyruvic-transaminase and glutamate dehydrogenase. Lactic dehydrogenase activity was slightly inhibited whereas glucose-6-phosphate dehydrogenase activity remained unchanged. Albumin abolished this inhibition and activated glutamate dehydrogenase in the presence of bile. Protein and bile pigments did not interfere with enzyme activity. The inhibitory effect of deproteinized human gallbladder bile may be due to steric alterations in the enzyme molecule through the action of bile acids.

0853 ENZYMES IN HUMAN BILE. II. ENZYME CONTENTS OF LIVER AND GALLBLADDER BILE. *(Ger.)* Lorentz, K. (Med. Acad., Lübeck, Germany), E. Niemann, G. Jaspers and D. Oltmanns. *Enzym Biol Clin* 10(6):528-533, 1969.

The concentration and daily excretion of 13 enzymes in human liver bile was determined and compared with those of gallbladder bile and serum. Levels of glutamate dehydrogenase, glutamic-oxaloacetic-transaminase, lactic dehyrogenase, hydroxybutyrate dehydrogenase, ornithine carbamoyltransferase and alkaline phosphatase were higher in gallbladder bile than in serum, whereas, glutamic-pyruvic-transaminase and the esterases including cholinesterase were higher in serum than in bile. There was no relation between gallbladder or liver bile concentration and serum levels for any enzyme. When enzyme excretion was compared on the basis of 24 hr liver bile, a statistically significant correlation was found for glutamic-oxaloacetic-transaminase/glutamic-pyruvic transaminase and lactic dehydrogenase/lactic dehydrogenase, indicating that the activities of these enzymes originate in serum but not in the liver cell.

0854 REACTION OF THE HEPATIC TISSUE OF VARIOUS
LABORATORY ANIMALS TO SINGLE ADMINISTRATION OF THIOACETAMIDE. *(Ger.)* Förster, M. (Path.
Dept., Municipal Hosp., Munchen-Schwabing, Germany
Beitr Path Anat 139(4):421-438, 1969.

Single doses of thioacetamide, 300 mg/kg i.p., wer
administered to rats, mice, golden hamsters, guine
pigs and rabbits and their effect on liver tissue
was followed after 24 and 48 hr. Necroses develop
in all animal species in the central part of the
hepatic lobules and were similar in size in rats a
mice, were larger in guinea pigs and rabbits, and
were most extensive in golden hamsters. At 24 hr,
these necroses were fully developed in rats and
mice, just began to appear in guinea pigs and rabbits and were not yet present in the golden hamste
At 48 hr, they were completely resorbed in rats an
largely resorbed in mice but still fresh in guinea
pigs, rabbits and golden hamsters. The necroses
were associated with glycogen depletion of the liv
cells that was complete in rats, mice and golden
hamsters but only partial in rabbits and guinea
pigs. Regeneration of the liver cells started at
the periphery of the hepatic lobule and was paralleled by increased glycogen synthesis. The centra
localization of the necroses may be due to greater
vulnerability of the central liver cells and relat
to their low supply of oxygen and enzymes.

0855 RIBONUCLEIC ACID AS AFFECTED BY HEPATOCARCINOGENESIS. *(E.)* Dessev, G. N. (Biochem. Res. Lab., Acad. Sci., Sofia, Bulgaria), B. M. Mullock, E. Reid and M. K. Turner. *Brit J. Cancer* 23(3):597-615, 1969.

The effect of dietary carcinogenic (ethionine and
azo dye) and non-carcinogenic (α-napthylisothiocya
nate) agents on the rate of RNA synthesis in hepat
mas and liver was studied in rats. In ethionine-induced hepatomas and in the liver of ethionine-fe
rats, the ratio of nuclear RNA to DNA was increase
with the most marked increase occurring in a fraction insoluble in M NaCl. Microsomal RNA content
the liver was decreased in azo dye-fed but not in
ethionine-fed rats. When a labeled precursor (^{14}C
orotate) was injected i.p., RNA labeling was highe
in supernatant fraction than in the crude nuclear
other particulate fractions in hepatomas. Electro
phoresis of RNA from liver tissue fractions gave 1
and 28S RNA and the relative specific activity
(18S:28S) was within normal limits in ethionine-fe
rats and in hepatomas. Post-microsomal RNA was mo
highly labeled than microsomal RNA in liver and
hepatomas. The rate of RNA synthesis (measured by
the rate of RNA labeling vs precursor labeling in
whole liver tissue) was decreased in α-naphthylisc
thiocyanate-fed rats, was increased in ethionine-f
rats and was markedly increased in hepatomas.

0856 INCORPORATION OF TRITIATED DIMETHYLNITROSAMINE INTO SUBCELLULAR FRACTIONS OF MOUSE LIVER AFTER LONG TERM ADMINISTRATION OF DIMETHLYNITROSAMINE. *(E.)* Takayama, S. (Cancer

st., Tokyo, Japan) and M. Muramatsu. *Z Krebs-*
rsch 73(2):172-179, 1969.

e distribution of radioactivity from dimethylni-
osamine-^{3}H (DMN-^{3}H) in both total and lipid free
id-insoluble fractions of subcellular components
liver was determined in mice during the course
DMN hepatocarcinogenesis. One hr after DMN-^{3}H
jection, most radioactivity was incorporated in
e supernatant fraction while microsomes incorpo-
ted very little. Washing with acid followed by
pid solvents did not change this tendency, thus
dicating that some incorporated radioactivity was
und firmly to protein or nucleic acids in these
actions. Mitochondria showed a higher specific
tivity than other fractions in which specific
tivity of lipid-free acid insoluble material was
e constant. Most radioactive incorporation into
clear fractions was lipid and acid-insoluble and
indicate a firm binding to nucleic acid or pro-
ns while in other fractions only 18 to 44% in-
poration was lipid and acid insoluble. During
course of DMN hepatocarcinogenesis, specific
terns of incorporation were observed, most of
ch could be correlated with morphological
nges including an early rise and fall of total
orporation which produced acute cell reactions
lowed by degeneration.

7 STIMULATORY EFFECT OF ECDYSTERONE ON RNA SYSTHESIS IN MOUSE LIVER. *(E.)* Otaka, T.
arm. Inst., Tohoku U., Aobayama, Japan) and M.
iyama. *Chem Pharm Bull* 17(9):1883-1888, 1969.

8 INDUCED METABOLIC ALKALOSIS IN HEPATIC ENCEPHALOPATHY. *(E.)* Lascelles, P. T.
t. Hosp., London, England) and W. H. Taylor.
cet II(7634):1364-1365, 1969.

9 EFFECTS OF IMMOBILIZATION OF RAT LIVER TRYPTOPHAN PYRROLASE AND BRAIN 5-HYDROXY-
PTAMINE METABOLISM. *(E.)* Curzon, G. (Inst.
rology, London, England) and A. R. Green. *Brit*
harmacol 37(3):689-697, 1969.

0 DISULFIRAM IMPAIRMENT OF DRUG METABOLISM BY RAT LIVER MICROSOMES. *(E.)* Stripp, B.
t. Heart Inst., Nat. Inst. Health, Bethesda,
), F. E. Greene and J. R. Gillette. *J Pharmacol*
Ther 170(2):347-354, 1969.

1 THE PROCESSES OF BILE FORMATION. *(Fr.)* Erlinger, S. (Beaujon Hosp., Clichy,
nce) and R. Preisig. *Rev. Franc Etud Clin Biol*
2):17-21, 1969.

2 CONTROL OF HAPATIC MITOCHONDRIAL CO_2 FIXATION BY GLUCAGON, EPINEPHRINE, AND COR-
OL. *(E.)* Adam, P. A. J. (Sch. Med., Case
tern Reserve U., Cleveland, Ohio) and R. C.
nes, Jr. *J Biol Chem* 244(23):6444-6450, 1969.

0863 LIVER FUNCTION AND BLOOD FLOW IN NORMAL MAN DURING INFUSION OF VASOPRESSIN. *(E.)* Jacobsen, K. R. (U. Hosp., Copenhagen, Denmark), L. Ranek and N. Tygstrup. *Scand J Clin Lab Invest* 24(3):279-284, 1969.

0864 MEASUREMENT OF ACETYL COENZYME A IN RAT LIVER. *(E.)* Lumbers, J. (Med. Res. Council Labs., Carshalton, Surrey, Eng.), C. J. Threefall and H. B. Stoner. *Anal Biochem* 31(1-3): 21-32, 1969.

0865 A DIRECT ESSAY FOR LIVER PHENYLALANINE HYDROXYLASE. *(E.)* Bublitz, C. (U. Colorado Sch. Med., Denver). *Biochim Biophys Acta* 191(2):249-256, 1969.

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IN LIVER OF FETUSES AND ADULT PIGS. *(Rus.)*
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0901 STUDIES ON THE TERMINAL INNERVATION OF THE EXTRAHEPATIC BILIARY DUCT IN DOGS: NOTE 1: REPORT ON THE NEUROMORPHOLOGY OF THE NORMAL CONDITION. *(It.)* Grapulin, G. (Inst. Clin. Gen. Surg., Surg. Ther., U. Padua, Italy) and A. Ottolenghi. *Arch De Vecchi Anat Pat* 51(3):759-770, 1968.

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- P:Secr:Int (0907)(0909)
- Diagproc (0935)
- D:Livbil (1346)(1353)(1368)
- D:Livbil:Cirrh (1442)
- D:Livbil:Gallb (1459)

Intestine

0902 ELECTRICAL MEASUREMENTS OF CHANGES IN THE PASSIVE PERMEABILITY OF THE SMALL INTESTINE DURING ONTOGENY.

(E.) Hudson, D. A. (Dept. Physiol., U., Sheffield, England) and R. J. Levin. *Life Sci* 8(23):1271-1279, 1969.

Permeability characteristics, reflected by electrical potential differences in membranes of small intestine of chick embryos were studied in everted sac preparations. Preparations of newborn chick intestine were compared with preparations of chick enbryo intestine suspended in bicarbonate saline (38°C), which was gassed with 95% O_2 and 5% CO_2. Passive permeability changes were demonstrated during early ontogeny using three independent recording techniques. The embryonic intestine has a lower permeability to ions and fluid than does that of hatched chick. Increase in permeability may be partly explained by a large increase in mucosal surface area caused by an increase in length of microvilli of mucosal cells. Measurements of electrical resistance of the intestine show a 2- to 3-fold decrease from the embryo to the hatched chick stage, from a resistance range of 56 to 88 ohms/cm^2 serosal area, to 28 to 37 ohms/cm^2 serosal area, respectively.

0903 LOCALLY PRODUCED ANTIBODY IN HUMAN GASTROINTESTINAL SECRETIONS.

(E.) Kriebel, G. W. (Dept. Med., U. Chicago), S. C. Kraft and R. M. Rothberg. *J Immun* 103(6):1268 1275, 1969.

The distribution of immunoglobulins (IgG, IgA, IgM and IgD) was examined in concentrates of parotid saliva, gastric juice and duodenal contents 4 healthy subjects and 45 patients with miscellaneous diseases including gastrointestinal disorders. IgA predominated in parotid saliva, but immunoglobulins were not found consistently in unneutralized gastric juice. Of 40 duodenal specimens, 30 contained IgA, IgM and IgD; 25 contained all 4 immunoglobulins. For evaluation of the immunoglobulin source, antibody against bovine serum albumin (BSA) was employed as a specific marker. Anti-BSA was found in the gastrointestinal secretions, but not in the serum, of 9 subjects and was associated with IgA, IgD and IgM, but not IgG. In contrast, anti-BSA was frequently associated with IgG of serum and external secretions from subjects with high amounts of the circulating antibody. Anti-BSA associated with IgM was noted in gastrointestinal secretions but not in the serum. In subjects with minimal or no serum anti-BSA, the antibody was found in secretions from organs exposed to BSA, but not in the saliva from the unexposed parotid. Data indicate that lymphoid tissue of the gastrointestinal tract produces local antibodies which may play a role in external secretions.

0904 STUDIES OF INTESTINAL HYDROLYSIS OF PEPTIDES. I. L-GLUTAMINYL-L-PROLINE DIPEPTIDE HYDROLASE ACTIVITY IN THE HUMAN SMALL INTESTINE.

(E.) Rubino, A. (Child. Hosp. Med. Ctr., Boston, Mass.), M. Pierro, M. Vetrella, L. Provenzale and S. Auricchio. *Biochim Biophys Acta* 191(3):663-667, 1969.

Scrapings of intestinal mucosa from 19 subjects (26 to 73 yr old) were assayed for L-glutaminyl-L-proline dipeptide hydrolase and glycyl-L-proline dipeptide hydrolase activity. The jejunal enzyme activities (units per g protein) were 179±50.5 and 144±61 for L-glutaminyl-L-proline dipeptidase and glycyl-L-proline dipeptidase, resp; the corresponding ileal values were 95±37.2 and 70±30. Both enzyme activities were eluted from Sephadex G-200 in a single peak; the ratio between them was constant in the different fractions. Characterization studies were performed on the pooled fractions, and the two enzymes were found to differ with respect to pH and ion dependence. The K_m values of L-glutaminyl-L-proline dipeptidase were 2.93 to 6.6 mM and 4.02 to 5.27 mM for the jejunum and ileum, resp. The corresponding K_m values for glycl-L-proline dipeptidase were 2.10 mM and 1.92 mM. Glycy L-proline dipeptidase was activated 2-fold by Co^{2+} and up to 6-fold by Mm^{2+}. The two enzyme activites can be separated with heat treatment in the presenc of Mn^{2+}.

0905 RECOVERY OF ANAPHYLACTIC SENSITIVITY IN THE GUINEA-PIG ILEUM AFTER DESENSITIZATION.

(E.) Dale, M. M. (Dept. Pharmacol., U. Coll. London, England) and D. T. Okpako. *Immunology* 17(5):653-663, 1969.

Six weeks after sensitization with ovalbumin (250 μg in Freund's incomplete adjuvant, i.m.), guinea pig ileal sections were repeatedly challenged with egg albumin until desensitization occurred and, after various time intervals, the preparation was rechallenged to assess (by the Dale-Schultz reaction) the return of anaphylactic sensitivity. The dose response curve for the reaction was time dependent and was sigmoid for the first challenge and bell-shaped for the final challenge after 3 hr resensitization (in both curves, 10^{-6} g/ml ovalbumin produced maximal contraction). Following desensitization to 10^{-7} g/ml ovalbumin, the return response to the same concentration began at 15 min and reached the same magnitude as the initial reaction by 3 hr. There was a slower response return at higher doses, but at low doses, sensitivity recovery was very rapid. When guinea-pigs were passively sensitized with guinea-pig gamma-1-globulin (50 μg/ml), there was a mean recovered response of 33% maximum contraction at the final challenge with 2 μg/ml of antigen. When ileal preparations were maintained at 6C for the resensitization interval (3 to 4-1/2 hr), they gave appreciably smaller responses on second challenge than those maintained at 37C. At the first ileal challenge with 10^{-4} g/ml egg albumin in the presence of phenol (20 mM), no Dale-Schultz reacti occurred but, when phenol was removed, desensitization was noted. No response occurred when ileal strips were challenged in a calcium free medium with NaEDTA (0.5 mM).

0906 DIURNAL FLUCTUATIONS IN THE NUMBER OF CELLS IN MITOSIS AND DNA SYNTHESIS IN

E JEJUNUM OF THE MOUSE. *(E.)* Sigdestad, C. P.
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l S. W. Lesher. *Exp Cell Res* 58(1):159-162,
59.

e number of mitotic figures and label nuclei
s determined by autoradiographic and crypt
uash techniques in jejunal crypts from C57BL
ce injected i.p. with 50 μc of ^{3}H-thymidine.
tween 3 P.M. and 3 A.M., the number of labeled
clei/crypt and the number of mitotic figures/
ypt doubled. The peaks of both mitotic activity
l the number of cells synthesizing DNA occurred
3 A.M. and the low points at 3 P.M. There was
such diurnal variation in ^{3}H-thymidine incor-
ation per labeled nucleus.

)7 THE EXCRETION OF CYTOPLASMIC GLUTAMIC-
OXALACETIC-TRANSAMINASE (C-GOT) IN THE
ESTINAL TRACT, BILE AND URINE. *(Ger.)* Massarrat,
(Med. U., Marburg, Germany) and H. Köbler. *Arch*
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excretion of pig heart ^{131}I- or ^{125}I- labeled
OT into the bile, urine and isolated intestinal
ps after i.v. injection was studied in piglets.
hin 7 to 12 hr after injection, less than 1.5% of
C-GOT eliminated from the blood appeared in
e and urine. C-GOT was not actively eliminated
o the isolated intestinal loop but transferred
o its lumen by a passive process which occurred
ing the contact of intestinal mucosa with
sing fluids. The intestinal tract, bile and
ne are apparently not involved in the degrada-
n and excretion of C-GOT.

)8 INHIBITORY EFFERENT EFFECTS OF VAGUS AND
SPLANCHNIC NERVES ON SMALL INTESTINE
EPTORS. *(Russ.)* Itina, L. V. (Physiol. Inst.,
d. Sci. Byelorussian SSR, Minsk). *Fiziol Zh*
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igation of median sections of the small intestine
dogs with glucose or sodium chloride solutions
ucose, 10 ml 3.33 M) caused a decrease in condi-
ned saliva excretion, but had no effect on
onditioned excretion and other parameters. Thirty
of 6.6 M glucose 6.6 M glucose caused decreases
both conditioned and unconditioned excretion as
l as changes in respiration. The effect of the
t solution (30 ml 3.42 M NaCl) was more marked
n that of glucose. Sbudiaphragmatic severing of
h the vagus and splanchnic nerves, as well as
. injection of hexone, 1 mk/kg, enhanced the ac-
n of both glucose and sodium chloride. Under
mal conditions, the receptors of the small intes-
e seemingly are under constant inhibitory control
the central nervous system.

)9 ELECTRON MICROSCOPIC CHANGES IN MITOCHON-
DRIA OF THE INTESTINAL EPITHELIUM AND THE
ER IN MICE AND D-AVITAMINOTIC RATS AFTER PERORAL
TRIBUTION OF SODIUM FLUORIDE. *(E.)* Malmqvist, E.
pt. Endocrin., Karolinska Inst., Stockholm,
den) and H. Low. *J Ultrastruct Res* 29(3-4):276-
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e and Vitamin D-deficient rats, supplied with 0.026 M sodium fluoride in their drinking water, for 2, 7 or 14 days before sacrifice developed mitochondrial inclusions in the intestinal tract and the liver. Mitochondria from intestinal epithelial cells and liver cells from sodium-fluoride treated animals were swollen and exhibited needle-like depositions of an electron dense material associated with their inner membranes. The mitochondria of the tubular epithelium of the kidneys appears normal. In male adult mice, these mitochondrial changes were seen only during the winter, and not in the summer. In Vitamin D-deficient rats, mitochondrial deposition occurred in intestinal epithelium and in liver cells after exposure to fluoride, independent of season. No depositions were observed in the intestinal epithelium of animals treated with Vitamin D during the experiment. In the liver depositions could be demonstrated also after treatment with Vitamin D.

0910 EFFECTS OF STARVATION ON THE PROLIFERATION KINETICS OF THE MUCOSA OF THE SMALL AND LARGE BOWEL OF THE MOUSE. *(Ger.)* Wiebecke, B. (Inst. Path., U. Cologne, Germany), R. Heybowitz, U. Lohrs and M. Eder. *Virchow Arch Path Anat* 4(2):164-175, 1969.

Proliferation kinetics in different sections of intestinal mucosa were studied in mice during 4 days of fasting and after injection of ^{3}H-thymidine. In the course of starvation, the ^{3}H-index, the mitosis index, and the migration rate of differentiated cells decreased to 50% of control values. Total crypt cell population decreased only moderately whereas the number of DNA-synthesizing cells decreased markedly. Starvation-induced changes were greater in mice with low initial body weight and occurred earlier in the colon and jejunum than in the duodenum. After 3 days of fasting, the phase of DNA synthesis was prolonged to almost double the control value and the mean generation time for epithelial cells was 2.5 times longer than in normal mucosa. Delayed cell regeneration was reflected in prolonged survival time of the villous epithelia. Disease- or therapy-induced lesions seemingly will be particularly marked in intestinal mucosa in which regeneration capacity has been reduced by a deficiency or malabsorption syndrome comparable to starvation.

0911 DETERMINATION OF GUANOSINE 3', 5'-MONOPHOSPHATE IN TISSUES AND OF GUANYL CYCLASE IN RAT INTESTINE. *(E.)* Ishikawa, E. (Vanderbilt U. Sch. Med., Nashville, Tennessee), S. Ishikawa, J. W. Davis and E. W. Sutherland. *J Biol Chem* 244(23):6371-6376, 1969.

Concentrations of cyclic guanosine 3', 5'-monophosphate (GMP) were determined in tissues of various species (including the rat) by a modification of the method of Hardman. Cyclic GMP was detected in all rat tissues examined, and the small intestine contained relatively large amounts. The concentration of cyclic GMP in the rat small intestine was increased by theophylline (an inhibitor of cyclic nucleotide phosphodiesterase), suggesting a rapid turnover of cyclic GMP in rat small intestine. An enzyme system which catalyzed the formation of cyclic GMP from GTP was demonstrated in the rat; the enzyme required Mn^{+2} for maximal activity, was inhibited by ATP, and was apparently different from adenyl cyclase.

0912 AMINO ACID UPTAKE BY KIDNEY AND JEJUNAL TISSUE FROM DOGS WITH CYSTINE STONES. *(E.)* Holtzapple, P. G. (Child. Hosp., Philadelphia, Pa.), K. Bovee, C.F. Rea and S. Segal. *Science* 166(3912): 1525-1527, 1969.

Cystine and lysine accumulation *in vitro* in jejunal mucosa and kidney cortex tissue was studied in dogs by a method similar to that used in the elucidation of human tissue transport systems. Lysinuria was not clearly definable and increased arginine and ornithine excretion was not detected in the cystinuric dogs. Pure crystal calculi were found in 2 dogs in which cystine excretion was within normal range. Lysine and cystine uptake was either slightly reduced or normal in jejunal mucosa and kidney cortex tissue from these dogs. Canine cystinuria apparently is quite different from human cystinuria.

0913 THE INFLUENCE OF BRADYKININ AND ANGIOTENSIN ON THE MUSCULARIS OF THE DIGESTIVE TRACT IN EXPERIMENTAL ANIMALS. *(E.)* Kedzierska, L. (Med. Sch., Wroclaw, Poland). *Arch Immun Ther Exp* 17(5):674-697, 1969.

The influence of bradykinin and angiotensin on tone and amplitude of contraction of different segments of the isolated digestive tract was studied in rats, guinea pigs and rabbits. Angiotensin, at concentrations of 10^{-11}, strongly increased tone in rat stomach and small intestine; at 10^{-13}, increased tone in the terminal segment of the small intestine in rats and guinea pigs; and at concentrations of 2×10^{-9}, less strongly increased tone in small intestine of rabbits. Sensitivity to angiotensin was greater in rats and guinea pigs than in rabbits. Sensitivity to bradykinin was species dependent; at concentrations of 10^{-13} it was highest in rats and at 5×10^{-9}, was weakest in rabbits.

0914 REPARATIVE PROCESSES IN THE MUCOUS MEMBRANE OF THE SMALL INTESTINE IN LOCAL AND TOTAL IRRADIATION. *(Russ.)* Lebedeva, G. A. (no. affil, Moscow). *Med Radiol (Moskva)* 14(10): 36-42, 1969.

Rats, mice and dogs given total and local radiation doses (large enough to cause the development of acute intestinal syndrome) developed characteristic morphological changes in the epithelium of the small intestine. In all three species, cessation of cellular division in the intestinal epithelium was accompanied by an increase in the size of monoclear cells and the appearance of multinuclear cellular forms. In rats, the appearance of multinuclear cells was preceded by an increase in the nuclear area of mononuclear cells. Amitosis of the nuclei of mononuclear cells was one of the main routes of formation of multinuclear cells. Local irradiation of the stomach or exteriorized intestine was followed by reparative processes which began from focal proliferation of crypts in the epithelium.

0915 OBSERVATIONS ON SOME ACTIONS OF ERGOMETRINE, NORADRENALINE, AND DOPAMINE ON THE GUINEA-PIG VAS DEFERENS AND ON THE RABBIT JEJUNUM. *(E.)* Woodruff, G. N. (Dept. Physiol. Biochem., U. Southhampton, England), J. Agar, M. J. Albani, K. Allen and J. Folkard. *J Pharm Pharmacol* 21(12):86 861, 1969.

0916 ISOLATION OF CHICK INTESTINAL NUCLEI: THE EFFECT OF VITAMIN D_3 ON NUCLEAR METABOLISM. *(E.)* Lawson, D. E. M. (Dunn Nutr. Lab., U. Cambridge, England), P. W. Wilson, D. C. Barker and E. Kodicek. *Biochem J* 115(2):263-268, 1969.

0917 INTESTINAL DIGESTION AND ABSORPTION OF CHOLESTEROL AND LECITHIN IN THE HUMAN. *(E.)* Arnesjo, B. (Div. Physiol. Chem., U. Lund, Sweden), A. Nilsson, J. Barrowman and B. Borgstrom *Scand J Gastroent* 4(8):653-665, 1969.

0918 DIARRHEA AND ACCUMULATION OF INTESTINAL FLUID IN INFANT RABBITS INFECTED WITH *VIBRIO CHOLERAE* IN AN ISOLATED JEJUNAL SEGMENT. *(E.)* Williams, E. M. Vaughan (Dept. Pharmacol., Oxford, England), A. N. Dohadwalla and N. K. Dutt *J Infect Dis* 120(6):645-651, 1969.

0919 EXPERIMENTAL ILEOTUBAL ANASTOMOSIS IN T SOW. *(E.)* Wingate, M. B. (Temple U. Hos Philadelphia, Pa.) and L. Wingate. *Amer J Obstet Gynec* 105(8):1176-1180, 1969.

0920 METABOLISM OF VITAMIN D: A NEW CHOLECA CIFEROL METABOLITE, INVOLVING LOSS OF HYDROGEN AT C-1, IN CHICK INTESTINAL NUCLEI. *(E.)* Lawson, D. E. M. (Dunn Nutr. Lab., U. Cambridge, England), P. W. Wilson and E. Kodicek. *Biochem J* 115(2):269-277, 1969.

0921 INTESTINAL METHYLATION OF FOLATES. *(E.)* Chanarin, I. (St. Mary's Hosp. Med. Sch London, England) and J. Perry. *Lancet II*(7632): 1256, 1969.

0922 POSSIBILITY OF EXPLORATION OF THE FUNCT OF THE ENTEROCHROMAFFINE SYSTEM. *(It.)* Melchionda, N. (1st Inst. Spl. Path. Med. Clin. Method., U. Bologna, Italy), F. Benfenati, B. A. Mantovani and G. Aureli. *Arch Ital Mal Appar Dig* 35(6):602-612, 1969.

- P:Morph (0727)(0740)(0746)(0752)
- P:Absorp (0760)(0763)(0765)(0767)(0768)
- P:Motil (0774)(0779)
- P:Secr:Stom (0801)
- D:Stomduo:Peptulc (1115)
- D:S.Intest:Malabs (1216)

3 AFFERENT DISCHARGES FROM OSMORECEPTORS IN
THE LIVER OF THE GUINEA PIG. *(E.)* Niijima,
(Niigata U., Sch. Med., Japan). *Science* 166(3912):
9-1520, 1969.

liver (with the hepatic branch of the vagal
ve) was excised from guinea-pigs, perfused with
ndard Ringer solution or test solutions through
portal vein and the afferent activity from a
e filament of the vagal nerve was recorded.
n the perfusion system was switched from stan-
d Ringer solution (326 milliosmole/liter) to a
ertonic Ringer solution (346 milliosmole/liter),
increase was noted in the discharge rate of va-
afferents from the liver. At NaCl concentra-
ns of 150.2 mM (316 milliosmole/liter), 155.2
(326 milliosmole/liter), 160.2 mM (336 milli-
ole/liter) and 165.2 mM (346 milliosmole/liter)
impulses/5 sec. were 20±6, 23±5, 30±9 and 34±11,
p. Hypertonic Ringer solutions (343 milliosmole/
er), which were made by the addition of 17 mM
mannose, glucose, sucrose or NaCl to standard
ger solutions, also produced increases in the
charge rate. When the perfusion pressure was
reased by 20 cm H_2O, no change in discharge
e was noted. Osmoreceptors in the liver, which
linked to the central nervous system through
hepatic branch of the vagal nerve, seemingly
itor osmotic pressure of portal venous blood.

4 STUDIES ON THE LOCAL IMMUNITY OF INTESTI-
NAL TRACT OF CHICKENS AFTER ORAL ADMINIS-
TRATION OF NEWCASTLE DISEASE VIRUS. *(E.)*
o, R. (Natl. Inst. Hlth., Tokyo, Japan), Y. Akao,
Sasagawa and Y. Nomura. *Jap J Med Sci Biol* 22
:235-252, 1969.

enterotropic avirulent Newcastle disease virus
V-Ishii) which was administered p.o. in a dose
about 10^5-10^8 TCD_{50}/chick caused alimentary tract
ection in 4 week old White Leghorn or Rock-Horn
ckens. The virus was excreted in feces ($10^{4 \cdot 5}$-
$\cdot^5$ TCD_{50}/g feces) from 3 to 7 days after a dose
$10^{5 \cdot 8}$ TCD_{50}/chick. Indirect fluorescent antibody
rographs of sections of the small intestine
wed that a surface infection was established by
p.o. administration of virus. After a challenge
e 4 to 6 weeks later, the virus was scarcely re-
ered from the feces; the neutralizing activity
fecal extracts, probably coproantibody, was de-
strated a few weeks after administration of the
us. Bursectomy plus γ-irradiation (650 R), per-
med within 48 hr after hatching, exerted a pro-
nd influence on humoral immunity, particularly
agglutination inhibition antibody production in
serum. At the same time, the development of lo-
immunity of the alimentary tract was disturbed.
se chickens excreted the virus even after the
llenge dose. In contrast, thymectomy plus irra-
tion, or irradiation alone had no suppressive
ect on establishment of the resistance of the
estinal tract to reinfection. The local immunity
the tract against refeeding of the virus prob-
y depends largely on humoral immunity governed
the bursa-dependent lymphoid system, and prob-
y on IgA antibody which is produced locally by
phoid cells of the lamina propria.

0925 THE DISTRIBUTION OF PORTAL BLOOD FLOW BEFORE AND AFTER HEPATIC RESECTION IN DOGS. *(E.)* Ohlsson, E. G. (Johns Hopkins U. Sch. Med., Baltimore, Md.), R. B. Rutherford, M. Haalebos, H. N. Wagner, Jr. and G. D. Zuidema. *J Surg Res* 9(12): 657-663, 1969.

The effect of hepatic resection on the distribution of portal venous blood in the liver was studied in anesthetized mongrel dogs. Prior to and at various times after resection, 15 and 25 μ microspheres (labeled with ^{141}Ce, ^{51}Cr or ^{85}Sr) were injected through a portal venous catheter and at the same time peripheral venous blood was drawn for biochemical study. With either 50 or 75% resection, SGOT, SGPT, alkaline phosphatase and bilirubin levels were similar to those noted in the controls with laparotomy, open liver biopsy and microsphere injection. Hemoglobin values were 14.7±2.7 gm% before resection and 13.0±1.9 gm% 7 days postoperatively. Portal venous pressure was significantly increased by 75% but not 50% resection. The shunt indexes for 15 μ and 25 μ microspheres showed that in all cases almost 100% of the radioactivity could be accounted for in the liver before and 1 week after resection. There was no significant difference in intralobular distribution of the injected microspheres before, immediately after or 1 week after 50% resection. Liver biopsy showed that the microspheres were usually trapped in the vessels in or near the portal triad without surrounding tissue reaction.

0926 A REVALUATION OF HEPATIC AND CYSTIC ARTERIES. THE IMPORTANCE OF THE ABERRANT HEPATIC BRANCHES. *(E.)* Vandamme, J. P. (Vesalius Inst. Anat., Louvain, Belgium), J. Bonte and G. van der Schueren. *Acta Anat* 73(2):192-209, 1969.

0927 PROSTAGLANDINS A_1, A_2 AND 19-HYDROXY A_1; THEIR ACTIONS ON SMOOTH MUSCLE AND THEIR INACTIVATION ON PASSAGE THROUGH THE PULMONARY AND HEPATIC PORTAL VASCULAR BEDS. *(E.)* Horton, E. W. (Sch. Pharm., U. London, England) and R. L. Jones. *Brit J Pharmac* 37(3): 705-722, 1969.

0928 DEMONSTRATION OF THE EFFECT OF IRRADIATION ON CANINE BOWEL USING *IN VIVO* PHOTOGRAPHIC MAGNIFICATION ANGIOGRAPHY. *(E.)* Bosniak, M. A. (N. Y. U. Med. Ctr., New York), M. A. Hardy, J. Quint and N. A. Ghossein. *Radiology* 93(6): 1361-1368, 1969.

0929 THE APPEARANCE OF A CHOLERAGENIC AGENT IN THE BLOOD OF INFANT RABBITS INFECTED INTESTINALLY WITH *VIBRIO CHOLERAE*, DEMONSTRATED BY CROSS-CIRCULATION. *(E.)* Williams, E. M. Vaughan (Dept. Pharmacol., Oxford U., Cambridge, England) and A. N. Dohadwalla. *J Infect Dis* 120(6):658-663, 1969.

0930 THE INFLUENCE OF THE PERIARTERIAL NERVE FIBERS ON AN ISOLATED AND PERFUSED SMALL MESENTERIC ARTERY. *(E.)* Speden, R. N. (Dept. Physiol., U. Tasmania, Hobart). *Aust J Exp Biol Med Sci* 47(5):553-564, 1969.

0931 BLOOD FLOW MEASUREMENTS IN CANINE PANCREATIC ALLOGRAFTS. *(E.)* Pennell, T. C. (Bowman Gray Sch. Med., Wake Forest U., Winston-Salem, N. C.), E. C. Miller and T. Midford. *Amer Surg* 35(12):871-878, 1969.

0932 THE PHYSIOLOGICAL MECHANISM INVOLVED IN HANGOVER:1. THE OXIDATION OF SOME LOWER ALIPHATIC FUSED ALCOHOLS AND ALDEHYDES IN RAT LIVER AND THEIR EFFECT ON THE MITOCHONDRIAL OXIDATION OF VARIOUS SUBSTRATES. *(E.)* Hedlund, S. G. (Inst. Zoophysiol., U. Uppsala, Sweden) and K.-H. Kiessling. *Acta Pharmacol* 27(5):381-396, 1969.

- D:Livbil:Cirrh (1448)

BIOASSAY IN THE DIAGNOSIS OF THE
ZOLLINGER-ELLISON SYNDROME. (E.)
en, B. J. (U. Mississippi Med. Ctr., Jackson),
. Hardy, M. D. Turner, C. F. Lowe, D. G. Hunt
W. A. Billups. *Ann Surg* 170(6):922-928, 1969.

m and gastric juice (buffered to pH 7) of 30
ents suspected of having the Zollinger-Ellison
rome and of 10 controls was assayed by a rat
ric perfusion technique of gastrin bioassay.
uots of the same serum were assayed simultane-
y in 4 rats, and a minimum of 4 determinations
carried out on each sample. Positive results
obtained with the sera of 4 patients and with
gastric juice of 2 of these 4. The diagnosis
ollinger-Ellison syndrome was established sur-
lly in 3 of these patients and strongly sus-
ed in the 4th. One patient with a negative
onse was found at laparotomy to have a recur-
pancreatic islet-cell carcinoma. Another pa-
t with a negative response had been surgically
ted for Zollinger-Ellison syndrome 5 years pre-
sly. Sera from 4 other patients were positive
in every 6 determinations, and the fasting
of the controls were positive once in every 12
rminations.

THE RECOGNITION OF ATROPHIC GASTRITIS.
(E.) Kirkpatrick, J. R. (Welsh Natl. Sch.
, Cardiff), G. T. Davis, A. Jacobs and S. W.
iams. *Brit J Surg* 56(10):742-746, 1969.

detection of potential atrophic gastritis, 107
ents (over age 40 yr) were subjected to barium
, gastric secretion studies, tests for circula-
parietal cell antibodies and gastric biopsies.
roscopy and gastric photography were performed
4 and 45 of these patients, resp. Atrophic
ritis was diagnosed by gastric biopsy in 65% of
patients, by barium meal and gastroscopy in 53%,
gastric photography in 27%. Hypochlorhydria was
ent in 77% of patients with atrophic gastritis.
incidence of false-positive diagnoses was low,
therefore, a positive diagnosis by any of the
ods should be an indication for further investi-
on.

EXPERIMENTAL PANCREATIC SCANNING: PRELIM-
INARY RESULTS USING INTRO-ARTERIAL ^{75}Se-
NOMETHIONINE AND HORMONE STIMULATION. *(E.)*
c, E. A. (U. Vermont Coll. Med., Burlington) and
. Kasenter. *Radiology* 93(6):1376-1379, 1969.

urements of liver and pancreas uptake of ^{75}Se-
nomethionine (intra-arterial and i.v. adminis-
ion) in the dog were obtained using conventional
tiscanning, following stimulation of the pancre-
ith secretion or pancreozymin. The relative
nt of ^{75}Se taken up by the pancreas was highest
r intra-arterial administration of the isotope.
effect is enhanced when the gland is stimulated
secretion or pancreaozymin, resulting in an im-
ed pancreatic scan. The liver takes up a large
nt of isotope and remains a source of inter-
nce. Intra-arterial administration of isotope
following pancreatic stimulation may be a valuable diagnostic method in the study of the pancreas and of pancreatic disease.

0936 SERUM PROTEIN ELECTROPHORESIS IN CIRRHOSIS. *(E.)* Ravel, R. (St. Francis Hosp., Miami Beach, Florida). *Amer J Gastroent* 52(6):509-514, 1969.

The effectiveness of a single serum protein (gamma globulin) electrophoretic pattern in the diagnosis of cirrhosis was studied using autopsy records from 51 patients with well-established (microscopy) cirrhosis. Six distinct groups of cirrhotics were found on the basis of electrophoretic configuration (normal levels and mild, moderate to marked elevation with and without beta peak incorporation into gamma). The majority of patients were in the group which demonstrated only mild to moderate elevation of gamma globulin. There was little or no correlation between type of electrophoretic pattern, clinical course of cirrhosis, liver microscopic structural alterations, and results of liver function tests. Utility of serum protein electrophoresis for diagnosis of cirrhosis appears to be limited.

0937 RADIOLOGIC INVESTIGATION DURING BILIARY TRACT SURGERY. *(E.)* Saracca, L. (U. Rome, Italy) and M. Ermini. *J Abdom Surg* 11(12): 148-155, 1969.

A procedure (involving radioscopic television picture, manometric records of pressures and radiographic and cinematographic records of morphodynamic aspects of internal bile ducts) is described for monitoring the functional condition of the biliary tract during surgery. Advantages of this procedure include: the ability of more people to follow the surgical procedure; better visualization of all of the biliary tree; ease of tracing the flow of radio-opaque substance; and direct observation of changes due to the introduction of pharmacodynamic substances and their effect on the sphincter of Oddi.

0938 EVALUATION OF pH TELEMETRY IN THE CLINICAL STUDY OF GASTRIC PHYSIOLOGY. *(E.)* McAlhany, J. C., Jr. (VA Hosp., Charleston, S.C.), D. R. Yarbrough, III, M. G. Weidner, Jr. and R. Ravenel. *Amer Surg* 35(12):836-844, 1969.

The method of gastric analysis using the augmented histamine stimulation test was simplified by the use of the Heidelberg pH telemetering capsule. To compare the 2 methods, basal specimens were collected for 1 hr in 26 patients after a 12 hr fast, histamine acid phosphate (0.04 mg/kg) was administered, and secretions were collected for the subsequent hr. Acid determinations were performed on the specimens by titration with NaOH to pH 7.4 and on the following day, intragastric pH was monitored continuously with the Heidelberg pH capsule. Gastric acid was neutralized with $KHCO_3$ and acid production was determined from the amount needed to maintain a gastric pH of 7.4. A statistical comparison showed the modification to be highly accurate. The technique is simpler and more comfortable to the patient. The effectiveness of medical therapy (hourly feedings of 60 cc milk and 30 cc antacid) was studied in 16 acid-peptic disease patients using the Heidelberg pH capsule. In 7 patients acidity neutralization was short lived, in 4 the pH gradually lowered, and in 5 there was prolonged neutralization. This method of study may allow earlier recognition of the disease process and more adequate treatment of poorly responding patients. The Heidelberg capsule was also used to study gastro-esophageal reflux in 15 patients (10 with X-ray diagnosed hiatal hernia). Acid reflux was detected by the capsule in 6 patients with symptoms of acid reflux, but in none of the asymptomatic hiatal hernia patients. One of the controls showed acid reflux. Three patients were treated surgically for hiatal hernia and none demonstrated acid reflux postoperatively.

0939 THE DIAGNOSIS OF ESOPHAGEAL VARICES: A COMPARISON OF THE ESOPHAGRAM AND SPLENOPORTOGRAPHY. *(Port.)* Huggins, D. (Inst. Trop. Med., U. Pernambuco, Brazil), G. Machado and V. P. Costa. *GEN* 24(1):13-21, 1969.

The accuracy of the esophagram and splenoportography in the diagnosis of esophageal varices was compared in 60 patients with portal hypertension. Both methods were positive in 15 (25%) patients and negative in 12 (20%). Esophageal varices were detected by splenoportography in an additional 23 (38.3%) cases and by the esophagram in an additional 10 (16.6%) cases. The diagnostic accuracy of splenoportography was 79% and the esophagram 52%.

0940 FRAGMENTATION OF THE RETICULUM IN THE HISTOLOGICAL DIAGNOSIS OF ULCERATIVE COLITIS. *(Sp.)* Valencia-Parparcen, J. (Gastroent. Clin., U. Hosp., Caracas, Venezuela) and B. Bruni-Celli. *GEN* 24(1):23-34, 1969.

Rectal biopsies of 184 patients with diseased colon were studied in order to diagnose ulcerative rectocolitis in its early phases where classic diagnostic methods fail. The biopsies were taken directly from the second valvula using a standard clamp and endoscope and examined under a light microscope. The segmentation and destruction of the reticule is more frequent in ulcerative rectocolitis than are the ulceration of the crypts and the formation of abscesses. With the absence of the latter two which only appear in the acute phase, the following are sufficient for making the diagnosis of ulcerative rectocolitis: the evidence of infiltration of the chorion, the decrease of the calciform cells in the glands, the increase of the mitosis, and the segmentation or destruction of the reticule.

0941 ANGIOGRAPHIC DIAGNOSIS OF HEPATIC DISEASES. *(Sp.)* Guelrud, M. (U. Hosp., Caracas, Venezuela), H. Nino and J. Valencia-Parparcen. *GEN* 24(1):35-45, 1969.

The hepatic arterial tree was visualized by selective arteriography of the celiac trunk, the hepatic artery and the upper mesentery in 46 patients with hepatic disease. In 20 patients with suspected hepatic metastasis, positive diagnosis through arteriography was made in 7 and negative in 13. A positive diagnosis was made in all 5 suspected cases of hepatoma and was characterized by an enlarged hepatic artery and vascularized tumor zones, with abnormally wide arteries on the periphery. All 9 cases of cirrhosis were positively diagnosed by arteriography but there was no definite arterial pattern for this disease. In 1 case of hepatic abcess, the arteries were displaced around a large avascular area surrounded by a dense arc and, in 2 cases of hepatic cysts, simila arterial displacement occurred but there was no dense arc.

0942 *IN VIVO* DIALYSIS OF FECES AS A METHOD O STOOL ANALYSIS IV. THE ORGANIC ANION COMPONENT. *(E.)* Wrong, O. M. (Roy. Postgrad. Med Sch., London, England), R. Rubinstein and A. V. Howard. *Clin Sci* 37(2):549-564, 1969.

Fecal dialysates, obtained by *in vivo* dialysis of feces from normal subjects eating a normal diet, pure carbohydrate diet or a methyl cellulose diet from subjects on a normal diet taking a mixture o 4 intestinal antibiotics, and from 10 uremic patients, were analyzed for total organic anion concentration by titration and for individual organi anions by gas chromatography. The fecal dialysat composition was compared with that of saline whic had been instilled into the colon of 5 patients with mid-transverse colostomies. The mean true o ganic anion concentration of 13 control subjects was 172 mEq/liter and the mean total organic anio concentration was 179 mEq/liter. On the carbohydrate and methyl cellulose diets the total organi anion concentrations were 97 and 48 mEq/liter, re There was a significant negative correlation betw the pH and total organic anion concentration of t dialysates. Lower fatty acid anion concentration (mEq/liter) in the control dialysates were acetat 46, proprionate 17, n-butyrate 15, isovalerate 2.2 n-valerate 1.7, formate 1.6 and isobutyrate 1.6. The concentrations of succinate, fumarate and lactate were 4.2, 0.8 and 0.6 mEq/liter, resp. The subjects on the carbohydrate diets showed decrease in most of the lower fatty acid anions, but the Krebs cycle anions doubled. All the organic anio except lactate decreased in concentration with the methyl cellulose diet. Colonic perfusates showed fatty acid anion pattern similar to that of the c trols, but at much lower concentrations. Intestin antibiotics caused no change in total organic anio concentration, but caused a marked reduction in mo of the fatty acid anions and an increase in succinate; the dialysates from the uremic patients sho similar changes. Fecal organic anions seemingly mainly derived by bacterial action on precursors dietary origin, but that there is also a slight c tribution from endogenous sources.

943 HYPOTONIC DUODENOGRAPHY FOR IMPROVED RADI-
OLOGIC EVALUATION OF PANCREATICODUODENAL
ISEASE. *(E.)* Eaton, S. B. (Letterman Gen. Hosp.,
an Francisco, Calif.), K. T. Benedict, Jr., J. T.
errucci, Jr. and D. J. Fleischli. *Conn Med* 33(12):
54-768, 1969.

ypotonic duodenography is described as a safe and
imple technique for optimal demonstration of the
uodenum and for improving radiologic diagnosis of
ancreatic disease. The examination is begun by in-
ubating the duodenum up to the tip of the pyloric
anal with a polyethylene tube maneuvered under
luoroscopic control. Duodenal relaxation is pro-
uced by i.m. administration of 60 mg of probanthe-
ine bromide, and barium is administered through the
ube to produce duodenal distension, spot films are
aken before and after the barium is aspirated, and
ne duodenum is insufflated with air to produce a
ouble contrast examination. The procedure is rec-
mmended in suspected cases of duodenal or pancrea-
ic cancer and in follow-up studies for convention-
l "G.I. series" yielding weakly positive or equivo-
al results.

944 THE STUDY OF CHRONIC PANCREATITIS USING
5 U./KG. SECRETIN STIMULATION. *(E.)*
rdalo, O. (Fac. Med., U. Lisbon, Portugal), M. S.
ixeira and C. Sakelarides. *Amer J Gastroent*
(6):528-531, 1969.

standard 1 μ/kg secretin test was performed in 70
tients with clinical pancreatitis. Patients were
bjected to the "Maximal Secretin Test" employing
μ/kg when peak bicarbonate concentration of "stan-
rd test" was lower than 105 mEq/l. In all cases
chronic pancreatitis, peak bicarbonate concentra-
on after 5 μ/kg was lower than values of normal
ntrol subjects. A wider application of this test
pancreatic disorders is probable particularly
en the response to 1 μ/kg produces equivocal
sults.

945 TEN YEAR EXPERIENCE WITH DIRECT CHOLANGI-
OGRAPHY. *(E.)* Bardenheier, J. A. III
t. Louis U. Hosp., Mo.), D. L. Kaminski, V. L.
llman and C. R. Hanlon. *Amer J Surg* 118(6):900-
5, 1969.

e results of 566 operative and 145 postoperative
-tube) cholangiograms is presented with an analy-
s of feasibility, accuracy, usefulness, and com-
ication of the procedure. The following conclu-
ons can be made: Direct cholangiograms are satis-
ctory in 90% of examinations. A 90% accuracy in
edissection cholangiograms has been attained, but
more standardized method of duct exploration
uld reduce the non-productive duct explorations.
utine predissection cholangiography may be per-
rmed in all patients undergoing biliary tract
rgery. Postdissection cholangiography is recom-
ended in all patients undergoing common duct ex-
loration since most overlooked stones will be dis-
vered at a time most convenient for correction.
stoperative T tube cholangiography is suggested
all patients after common duct exploration to allow for follow-up studies if abnormalities arise. The mortality for cholecystectomy in this study was 1.77% (six deaths were due to severe coexisting disease and the corrected mortality was 0.97%). The corrected mortality for common duct exploration was 5.5% with no deaths attributed to direct cholangiography.

0946 ASPIRATION BIOPSY IN THE DIAGNOSIS OF CHRONIC ENTEROCOLITIS. *(Russ.)* Menshikov, F. K. (no affil), N. T. Larchenko, V. A. Odinokova and S. A. Fadeeva. *Klin Med* 47(10):71-76, 1969. 1969.

Aspiration biopsy with a Shiner sond was used to obtain 0.3-0.5 mm^3 sections of mucous membrane (taken from the upper part of the small intestine 15 to 30 cm from the flexura duodenojeunalis) which were examined microscopically after diffential staining. Severity of the clinical course of the disease could be correlated with histological and histochemical changes in the mucous membrane. In moderate and severe forms of enterocolitis, inflammatory atrophic and dystrophic changes are seen in combination with regeneration.

0947 HIATAL HERNIA AND GASTROESOPHAGEAL REFLUX. A CLINICORADIOLOGICAL ANALYSIS OF MORE THAN 1000 CASES. *(E.)* Stilson, W. L. (Loma Linda U. Med. Ctr., Calif.), I. Sanders, G. A. Gardiner, H. C. Gorman and D. F. Lodge. *Radiology* 93(6):1323-1327, 1969.

A procedure for the diagnosis of hiatal hernia and gastroesophageal reflux employing a rounded balsa wood block placed under the lumbar region prior to p.o. administration of barium was compared with other positional methods of diagnosis in 1027 patients. (Balsa wood) block test revealed the highest incidence of hiatal hernia and patients with a negative block test did not show hiatal hernial by any other test. The incidence of hiatal hernia tended to increase with advancing age, suggesting a degenerative process. Gastroesophageal reflux was diagnosed in these patients by the water siphon test and positive results were independent of age, thus indicating a mechanism other than degeneration.

0948 A COMPARISON OF SALT-FLOTATION AND FORMOL-ETHER TECHNIQUES IN DEMONSTRATING HELMINTHIC OVA IN FECES. *(E.)* Saxena, S. N. (Maulana Azad Med. Coll., New Delhi, India), A. Varghese and B. G. Ray. *Indian J Med Res* 57(7):1213-1219, 1969.

Eight hundred samples for formed feces from patients with vague abdominal symptoms, including occasional diarrhea, were examined by salt flotation and formal ether techniques, in order to compare the relative efficacy of these techniques in demonstrating helminthic ova. Helminthic ova were observed in 272 samples (34%) of which 141 (51.84%) were detected by both techniques, while the number of positives picked up by salt-flotation and formal ether techniques were 73 (26.84%) and 51 (18.75%) samples, resp.

Salt flotation method is recommended for routine use in hospitals and public health laboratories in conjunction with direct microscopy of saline and iodine preparations and formal-ether concentration.

0949 THE RECTAL RADIOIODIDE TEST OF RATZKOWSKI IN THE DIAGNOSIS OF LIVER METASTASES: A CRITICAL STUDY OF METHODOLOGY AND RESULTS. *(Ger.)* Horak, Z. (Med. Fac., Purkyne U., Brno, Czechoslovakia), J. Dohnalek, M. Svabenikova and D. Kadlecova. *Nuclearmedizin* 8(3):266-274, 1969.

The radioiodide test of Ratzkowski (based on the theory that equilibrium of radioactivity in the liver after rectal application of radioiodide is established significantly earlier in tumor patients with intact liver than in those with hepatic metastases) was assessed in 69 tumor patients with and without liver metastases. Mean equilibration time for radioactivity was 9 min in intact livers versus 25 min in livers with tumor metastases. The results of the test agreed with clinical findings in 44% of the patients, were uncertain in 22% and falsely positive or negative in 34% of the cases. The test had 92% sensitivity but a specificity of only 19% indicating that its diagnostic value is not as great as claimed by Ratzkowski and other authors.

0950 A SPECIFIC ANTISERUM FOR GASTRIC MUCOUS EPITHELIUM. *(E.)* Lynraven, G. S. (Path. Dept., Monash U., Melbourne, Australia) and W. G. R. M. DeBoer. *Pathology* 1(1):57-60, 1969.

Rabbit antiserum to rat stomach antigen was shown by an immunofluorescence staining technique (using fluorescein-labeled goat anti-rabbit globulin) to react specifically with gastric mucous epithelium of man, rat, mouse, cat, pig and dog. The immunofluorescence staining specificity of the rabbit antiserum for gastric mucous epithelium is greater than that of histochemical stains such as alcian yellow which also reacts with mucous epithelial cells outside the stomach. Four successive absorptions of antiserum with rat colon homogenate did not change the staining capacity of the antiserum while a single absorption with rat gastric homogenate completely prevented staining. Antiserum to gastric mucosa provides a valuable reagent for positive identification of gastric epithelial cells in normal and pathological states.

0951 RADIOACTIVE ISOTOPES IN THE DIAGNOSIS OF GALLBLADDER DISEASES. *(Rus.)* Struchkov, V. I. (I. M. Sechenov Ist Moscow Med. Inst., USSR), A. V. Grigorian, V. G. Spesivtseva, V. S. Vasilyev, M. P. Rubin and V. V. Prokhorov. *Klin Khir* (10): 8-12, 1969.

Two new preparations (Bilignost and Bilitrast) containing radioactive iodine were used, in a dose of 3 to 4 microcuries/kg, in the evaluation of a method for radioactive scanning of the gallbladder. In patients with healthy gallbladders, there was a 20 to 30% gradient 1-1/2 hr after injection, visible by gamma-ray scintigram of the gallbladder, which decreased rapidly after a test meal. In 3 acute cholecystitis patients and in 21 of 64 patients with chronic cholecystitis, there was no concentration of radioactivity and no contrast; later operation showed the gallbladder to be necrotic and nonfunctional. A clear outline of the gallbladder was obtained in 43 patients with chronic cholecystitis, but the percent accumulation of radioactive iodine was low. In patients with dyskenesia of the bile duct, the radioactivity accumulated in the gallbladder and was still present 20 hr later.

0952 THE DIFFERENTIAL DIAGNOSIS OF BENIGN CHOLANGIOMA AND LIVER METASTASES. *(E.)* Zittel, R. X. (Inst. Path., U. Freiburg, Germany and G. Wegner. *German Med Monthly* 14(11):531-532, 1969.

Two cases of solitary subcapsular hepatic nodules, which were observed at laparotomy, are presented. The differential diagnosis included benign cholangioma and hepatic metastasis. The differentiation is not possible without histological examination (frozen section) of the nodule during the operation. Both cases proved to be benign.

0953 THE USE OF AN IMAGE CONVERTER, AND OF ROENTGENOTELEVISION IN X-RAY EXAMINATION OF THE STOMACH. *(Rus.)* Fridman, E. G. (Inst. of Exper. Clin. Oncol. Acad. of Med. Sci., Moscow, USSR). *Vestn Rentgen Radiol* (5):55-58, 1969.

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- D:Livbil (1350)(1359)(1366)(1390)
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GASTROINTESTINAL DISEASES

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19 AN EXPERIMENTAL GASTRIC ULCER OF THE RAT
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RESS. *(E.)* Takagi, K. (Fac. Pharm. Sci., U.
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ticholinergics (atropine, scopolamine, homotropine,
nactyzine, isopropamide, propantheline) which or-
narily prevent ulcers produced by minimal stress
-ulcers) produced a new type of ulcer (A-ulcer)
rats subjected to 20 hr of severe stress (verti-
l immersion in water bath). Scopolamine was the
st potent and homotropine the weakest producer of
ulcers. A-ulcers occurred in the fundus of the
omach (near the antrum) and along the greater
rvature and differed from S-ulcers macroscopically
that they extended into the bottom of the mucosal
mbrane without disrupting the muscularis mucosa.
covery from A-ulcers required about 10 days, and
eir formation was inhibited by previous fasting
d an increase in the immersion bath temperature.

20 GASTRIC AND PANCREATIC FUNCTION AND THE
ABSORPTION OF IRON, VITAMIN B_{12}, AND
LCIUM AFTER PROXIMAL GASTRIC RESECTION FOR CANCER
THE UPPER PART OF THE STOMACH. *(E.)* Fischermann,
(Dept. Surg., Finsen Inst., Copenhagen, Sweden),
Mouridsen, I. Neesgaard, H. Worning and A. Zacho.
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stric and pancreatic function and absorption were
udied in 12 patients (on a low fat-high protein
et and treated with vitamins A, B, B_{12}, C and
on) 2 to 8 yr after proximal resection for cancer
the upper part of the stomach. Half of the
tients were underweight, the majority had postci-
l complaints of the small stomach syndrome, and
lf had regurgitation with pyrosis. All patients
d normal serum iron, transferrin and calcium
vels. Iron absorption (percent of ingested amount)
s 12.3 to 21.5% in control subjects and 0.6 to
0% in the patients, while vitamin B_{12} absorption
s reduced in 4 of 5 patients with anacidity and
rmal in 7 patients. Exocrine pancreatic function
served after a standard fluid meal was only slight-
reduced in these patients.

21 ABSORPTION OF RADIOACTIVE IRON AFTER RE-
SECTION OF THE STOMACH AND GASTRECTOMY. *(E.)*
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on absorption (blood serum determinations) was
udied following p.o. administration of 2 milli-
ries of ^{59}Fe in 33 patients who 1 to 2 yr previous-
had undergone stomach resection by various surgi-
l procedures. There was no relation between iron
sorption and the type of gastric surgery, but iron
sorption did depend on the rate of food passage in
e small intestine, as determined by barium x-ray.
15 patients, there was an increase in the serum
on level with decrease in iron absorption. Ab-
rption in patients with an iron deficiency was
.8 ± 7.2%, and in patients without an iron defi-
ency 8.9 ± 4.1%.

1022 A BIOCHEMICAL-CELLULAR-MORPHOLOGICAL EXPLANATION OF THE DEVELOPMENT OF GASTRIC ULCER IN SHAY RATS. *(E.)* Mozsik, Gy. (U. Med. Sch., Pecs, Hungary), B. Kiss, M. Krausz and T. Javor. *Scand J Gastroent* 4(8):633-640, 1969.

Phosphorous and nucleic acid metabolism of the gastric wall of Shay rats was investigated 7 or 24 hr after pyloric ligation. A total of 12 ulcers were found in 10 animals 24 hr after pyloric ligation, but none were noted 7 hr after ligation in another 10 rats. Seven hr after pyloric ligation acid-soluble organic phosphates increased in both the glandular and membranous stomach wall, but fell below control values. Phospholipid phosphate and DNA levels were increased in both parts of the stomach wall at 7 and 24 hr post-ligation, with DNA levels being greater in the membranous than in the glandular area. RNA contents rose above control levels only in the membranous stomach wall 7 and 24 hr after ligation. The findings suggested the following steps in ulcer development: pyloric ligation, increased metabolism of carbohydrates, increased nucleic acid synthesis, exhaustion of carbohydrate metabolism, and appearance of ulcer. In the first phase of development (first 7 hr) the triggering effects of increased carbohydrate metabolism move from the periphery to the center of the cells, and in the second phase the central regulatory mechanisms are directed toward the periphery.

1023 A BIOCHEMICAL-CELLULAR-MORPHOLOGICAL EXPLANATION FOR ANTIULCEROGENIC EFFECTS OF PARASYMPATHOLYTICS AND OF SURGICAL VAGOTOMY IN SHAY RATS. *(E.)* Mozsik, Gy. (U. Med. Sch., Pecs, Hungary), B. Kiss, M. Krausz and T. Javor. *Scand J Gastroent* 4(8):641-651, 1969.

The anti-ulcerogenic effects of parasympatholytics (atropine, isopropamide or gastrixone, 1.0 mg s.c.) and of surgical vagotomy were studied in Shay rats. Biochemical examinations of the stomach wall were made 7 hr after drug administration and 24 hr after bilateral vagotomy. The parasympatholytics and vagotomy both dramatically decreased volume and acidity of gastric secretion, and vagotomy prevented ulcer development. The drugs primarily affected the phospholipids and acid-soluble organic and inorganic phosphates (results of carbohydrate metabolism) in the stomach wall and acted only secondarily on nucleic acids. Vagotomy primarily altered the synthesis of nucleic acids, particularly of RNA. The parasympatholytics inhibit the first phase (0 to 7 hr after ligation), and surgical vagotomy the second phase (7 to 24 hr) of Shay ulcer development.

1024 GASTRIC CANCER SIMULATING BENIGN GASTRIC ULCER. *(E.)* Gear, M. W. L. (United Oxford Hosps., England), S. C. Truelove, D. G. Williams, G. R. Massarella and M. M. Boddington. *Brit J Surg* 56 (10):739-742, 1969.

Malignant gastric ulcer was found in 6 of 70 patients referred for gastroscopy with a clinical and radiological diagnosis of benign gastric ulcer. Correct diagnosis was made in 3 cases by cytological or biopsy specimens, or both, obtained at the time of gastroscopy. Initial false-negative results in the other 3 patients were corrected after histological study of surgical specimens taken at gastrectomy. The false-negative results were due to difficulty in obtaining biopsy specimens at gastroscopy (since the malignant cells may not be present in the edge of the ulcer but may radiate out from the base) and to the variation in the cytological appearance from normal to obvious carcinoma cells with many intervening gradations of abnormality in between.

1025 PROLIFERATION OF ENDOCRINE-LIKE (ENTEROCHROMAFFIN) CELLS IN ATROPHIC GASTRIC MUCOSA. *(E.)* Rubin, W. (Cornell U. Med. Ctr., New York, N. Y.). *Gastroenterology* 57(6):641-648, 1969.

Per oral mucosal biopsies obtained from the body and pyloric antrum of normal stomachs and from the body of atrophic stomachs of 11 pernicious anemia patients were studied by light and electron microscopy. The atrophic mucosae contained numerous endocrine-like (enterochromaffin) cells both in the islets of ectopic intestinal epithelium and in the nonintestinal atrophic glands. In comparison with the endocrine cells from the body of the normal stomach, those in the intestinal crypts were generally more columnar in shape, often extended to the glandular lumen, and were characterized by radiolucent cytoplasmic matrix, dense granules in the cytoplasm, pleomorphic mitochondria, cytoplasmic filaments, apical centrioles, dense bodies, Golgi complexes and smooth and rough endoplasmic reticulum. The proliferation of such cells, which metabolize pharmacologically potent amines, probably plays a significant role in the physiology of atrophic stomachs.

1026 GASTRIC SECRETION AFTER MASSIVE SMALL BOWEL RESECTION. *(E.)* Windsor, C. W. O. (Queen Eliz. Hosp., Birmingham, England), J. Fejfar and D. A. K. Woodward. *Gut* 10(10):779-786, 1969.

Acute gastric hypersecretion (reflected by an increased rate of basal secretion) occurred in 8 of 19 patients following massive resection (more than 1/3) of the small intestine. Gastric hypersecretion was transient (lasting less than 14 days), was unrelated to the length of the intestine resected, and was positively correlated with histological evidence of hepatic parenchymal cell damage and elevated bilirubin levels and histamine release after acute hepatic injury. In a separate study, chronic gastric hypersecretion (without significant change in basal secretion) was demonstrated in dogs with Heidenhain or Pavlov pouches. Gastric hypersecretion was attributable to prolonged and enhanced response to food. Fecal fat measurements in these dogs provided no support for the view that malabsorption may be prevented by vagotomy and pyloroplasty, or that such procedures should be employed at the time of massive intestinal resection.

1027 ESOPHAGO-JEJUNAL-DUODENAL INTERPOSITION AFTER TOTAL GASTRECTOMY. *(E.)* Ribotta, G. (Gen. Surg. Clin., U. Rome, Italy) and V. Speranza *J Abdom Surg* 11(12):140-147, 1969.

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- D:Stomduo:Peptulc (1123)(1127)(1135)(1136) (1145)(1147)
- D:S.Intest (1150)(1151)(1166)(1193)(1198) (1200)
- D:L.Intest (1237)
- D:Pancreas (1315)(1316)(1317)(1320)
- D:Pancreas:Pancreat (1323)(1331)(1335)
- D:Livbil (1360)(1385)
- D:Livbil:Gallb (1492)(1498)
- D:Gen (1511)(1522)
- D:Gen:Parasit (1554)

1 EXPERIMENTAL DEFICIENCY OF GASTRIC "MUCUS BARRIER". ITS EFFECT ON GASTRIC SECRETION AND ON THE FORMATION OF ACUTE GASTRIC ULCER IN RATS INFUSED WITH HISTAMINE FOR 24 HOURS. *(E.)* Kowalewski, K. (Surgical-Med.
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output of HCl, pepsin and hexosamine was deter-
ed in adult male rats with permanent gastric
tulas (some with double ligation of pylorus and
dia) after i.v. infusion of 120 ml/kg of hista-
e dihydrochloride for 24 hr. Prior to infusion,
stomachs were washed with either normal saline
2M NaCl (in order to reduce gastric mucus). Con-
t of hexosamine (especially in dogs with double
ation) and HCl output in gastric secretion was
reased by washing with 2M NaCl. Output of hexos-
ne in response to histamine stimulation was sig-
icantly lower in stomachs washed with 2M NaCl
n with normal saline. Glandular peptic ulcers
er histamine infusion occurred in stomachs wash-
with 2M NaCl but not in those washed with normal
ine. Peptic ulcer appears to be correlated with
us barrier alterations in the rat stomach.

2 GASTRIC ACID SECRETION IN PATIENTS WITH DUODENAL ULCER TREATED FOR ONE YEAR WITH ANTICHOLINERGIC DRUGS. *(E.)* Kaye, M. D.
rdiff Roy. Infirm., Wales), P. Beck, J. Rhodes
P. M. Sweetnam. *Gut* 10(10):774-778, 1969.

copyrronium, l-hyoscyamine or placebo, 3 times/
for 1 yr in a dosage adjusted to produce toler-
e side effects, were administered at random to 3
ups of male patients with duodenal ulcer. Maximal
tric acid secretion in response to pentagastrin
µg/kg/hr) and basal secretion were measured im-
iately before and 1 week after cessation of
atment. Glycopyrronium increased mean basal acid
put (from 4.98 mEquiv/hr to 8.19 mEquiv/hr after
r) and insignificantly decreased maximal acid
put. Placebo and l-hyoscyamine did not mean basal
maximal acid outputs. Individual maximal acid
puts showed marked fluctuations in all 3 groups.
cludes that prolonged anticholinergic therapy
s not appear to reduce parietal cell mass in pa-
nts with duodenal ulcer.

3 LACTOSE MALABSORPTION IN PATIENTS OPERATED UPON FOR PEPTIC ULCER. *(E.)* Gudmand-Hoyer,
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lve patients with clinical symptoms of lactose
absorption, who had gastric surgery 1 to 19 yr
viously, were tested for lactose tolerance and
ll intestinal mucosal disaccharidase activity.
hough all patients had been operated upon for
tic ulcer, no ulcer was found in 4. Postopera-
ely, 3 patients developed diarrhea or other ab-
inal complaints, pre-existing symptoms were
kedly worsened in 3, and symptoms remained unchanged in another 3 (1 patient developed symptoms 17 yr postoperatively). Following lactose tolerance tests, a rise in blood sugar of 4-34 mg% was noted in the 12 patients (a rise of <55 mg% after gastric surgery is compatible with lactose malabsorption). The lactose tolerance tests evoked diarrhea in all but 1 patient. Lactase content was strongly reduced or absent in the intestinal specimens, while the content of other disaccharidases and alkaline phosphatase was normal. Steatorrhea was found in 3 of the cases. Patients with abdominal complaints (primarily diarrhea) after gastric surgery should be examined for lactose malabsorption, since they probably can be maintained symptom-free on an appropriate carbohydrate diet.

1114 EFFECT OF FAT IN THE DUODENUM ON GASTRIC ACID SECRETION BEFORE AND AFTER VAGOTOMY IN MAN. *(E.)* Johnston, D. (Gen. Infirm., Leeds, England) and H. L. Duthie. *Scand J Gastroent* 4(7):561-567, 1969.

Fat (olive oil emulsion) instillation into the duodenum, in amounts equivalent to one-half the mean daily human dietary intake, significantly inhibited (by 26 to 36%) histamine- and gastrin-stimulated gastric acid secretion in normal subjects and duodenal ulcer patients with intact vagi. Duodenal instillation of fat, in amounts equivalent to twice the mean daily dietary intake, significantly increased (by 76%) histamine- and gastrin-stimulated gastric acid secretion in duodenal ulcer patients who had undergone vagotomy with pyloroplasty. Inhibition of gastric secretion in man by fat in the duodenum seemingly has an important vagal component.

1115 PEPTIC ULCER: PHYSIOLOGICAL EVALUATION OF THE INFLUENCE OF DUODENAL ACIDIFICATION. *(E.)* Poth, E. J. (U. Texas Med. Branch, Galveston) and D. Gold. *Trans Southern Surg Ass* 80:154-160, 1969.

The inhibitory effect on gastric secretion produced by bathing the duodenal mucosa with acid gastric chyme was studied in a test model (20 cm segment of canine distal ileum anastomosed to the distal stomach following pyloric excision) and in a control model (formed by joining the distal end of the ileal segment to the proximal duodenum). A high incidence of ulceration occurred in the control model but there was no ulceration in the test model. The gastric secretory rates in the test model were similar to rate of acid secretion by the mucosa of Heidenhain-type pouches following exposure to acid gastric chyme.

1116 THE ACTIVITY OF SOME CYTOPLASMIC ENZYMES OF THE BLOOD AND MUCOUS MEMBRANE AND THE FUNCTIONAL STATE OF THE STOMACH IN PEPTIC ULCER. *(Russ.)* Vasilyuk, V. N. (Chernovitsk Med. Inst., U. S. S. R.). *Klin Med* 47(10):44-48, 1969.

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1150 A PROTEIN-DEFICIENT DIET: EFFECT ON THE LIVER, PANCREAS, STOMACH, AND SMALL INTESTINE OF THE RAT. *(E.)* Jervis, H. R. (Walter Reed Army Med. Ctr., Washington, D.C.), K. Madi, P. R. Anderson and M. R. Zimmerman. *Arch Path* 89(1):38-52, 1970.

In order to develop a model of chronic protein deficiency or experimental kwashiorkor, about 200 young, male and female albino Wistar rats were force-fed (FF) a high calorie, low protein (LP) diet for 39 days. Control groups included rats force-fed a high calorie, low protein diet for 39 days. Control groups included rats force-fed a complete diet, rats fed ad libitum, and rats fed on a pair-weight basis. Both the rats fed a high calorie, low protein diet and their pair-weight controls were smaller and more emaciated than the control rats fed a complete diet. At autopsy, the rats fed a high calorie, low protein diet were abnormally light yellow in color and appeared to be enlarged. Glycogen was consistently present in the liver of protein-depleted rats and there was loss of activity of most liver enzymes, but most dramatic was the disappearance of ATPase activity in the bile canaliculi. Rats fed a high calorie, low protein diet developed pancreatic atrophy and fatty infiltration of the pancreas and liver. The gastric and small intestinal mucosa was slightly thinner than controls and showed lower production of mucins, but only minor changes in enzymatic activity. Protein depletion did not result in impaired lipid absorption. Thus, the changes in liver and pancreas of the rats fed a high calorie, low protein diet were similar to those observed in kwashiorkor; the changes in the morphology of the small intestine were not. In the absence of all other manifestations of human kwashiorkor such as severe subcutaneous edema, extensive skin and hair changes, and sprue-like mucosal alterations, it is not possible to equate the syndrome produced in the rat to the kwashiorkor syndrome in children. In the rat on a protein deficient diet, the small bowel is not a prime target. However, the protein-depleted rat may serve as an important experimental model to study the combined effects of enteric infection and malnutrition.

1151 THE EFFECT OF JEJUNAL SEGMENT INTERPOSITION OF POST-GASTRECTOMY MALABSORPTION IN DOGS. *(E.)* MacKay, C. (Western Infirm., Glasgow, Scotland). *Brit J Surg* 56(10):767-771, 1969.

Metabolic studies and measurement of gastric emptying were performed in normal dogs and in dogs after gastrectomy (either alone or with antiperistaltic gastroduodenal or gastrojejunal segment or isoperistaltic gastroduodenal segment). Gastrectomy alone resulted in weight loss and steatorrhea. Jejunal segment interposition resulted in significant weight gain, reduced output of fat and nitrogen in the feces, and delay in gastric emptying. Gastroduodenal segments were more effective than gastrojejunal; antiperistaltic segments did not appear to have much advantage over isoperistaltic segments.

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BACTERIAL FLORA OF THE SMALL INTESTINE I
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with some form of blind loop. Nonsporing anaerob
bacteria (most usually Bacteroides) which were ab
to hydrolyze bile salts were among the most frequently isolated colonized organisms from jejunal juice. There was no correlation between fat excretion and bacterial colonization of the jejunum
Patients with regional enteritis, pancreatitis (i
the presence or absence of steatorrhea), idiopath
steatorrhea and celiac disease did not show any c
sistent pattern of bacterial colonization in thei
jejunal juices.

1153 FASTING BILE SALT POOL SIZE AND COMPOSITION AFTER ILEAL RESECTION. *(E.)* Abaur
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24-cholic acid and stimulation of gallbladder bil
by cholecystokinin in 4 patients with ileal resec
tion and 4 (control) patients without intestinal or hepatobiliary disease. The total fasting bile salt pool was decreased from 2875 mg in control patients to 2212 mg in the resected patients. Ch
lic acid decreased from 1562 mg in control patien
to 738 mg in the resected patients, chenodeoxycho
late did not change (1008 mg vs 925 mg), and deox
cholate increased from 304 mg in control patients to 549 mg in the resected patients. The ratio of glycine to taurine conjugates was 3.4 in control patients and 8.6 in the resected patients. About 3% of the bile salt pool in the resected patients was unconjugated and a small amount of lithocholi
acid conjugate was identified in each short bowel patient. Hepatic synthesis of bile salt and passive absorption of glycine conjugates apparently are increased and there is bile salt deconjugatio
and dehydroxylation by intestinal flora after ileal resection.

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1201 NONOCCLUSIVE MESENTERIC VASCULAR DISEASE: CLINICAL AND EXPERIMENTAL OBSERVATIONS. *(E.)* Britt, L. G. (U. Tennessee Coll. Med., Memphis) and R. C. Cheek. *Trans Southern Surg Ass* 80:68-75, 1968.

1202 INTESTINAL LYMPHANGIECTASIA. *(E.)* Forbes, G. B. (260 Crittenden Blvd., Rochester, N. Y.), G. H. Amirhakimi, M. Samloff and M. F. Bryson. *Amer J Dis Child* 117(2):178-185, 1969.

1203 DIABETIC DIARRHEA: A STUDY OF THIRTEEN PATIENTS WITH JEJUNAL BIOPSY. *(E.)* Malins, J. M. (Gen. Hosp., Birmingham, England) and N. Mayne. *Diabetes* 18(12):858-866, 1969.

204 PROBLEMS IN REANIMATION OF PRE- AND POST-OPERATIVE INTESTINAL OBSTRUCTIONS. *(It.)* Maggi, U. (Inst. Gen. Clin. Surg., Therap. Surg., U. Pavia, Italy), A. Scotti, P. Pietrobono, R. Zatelli and A. G. Sina. *Acta Anaesth* 20(4):761-777, 1969.

1205 ENTEROMESENTERIC INFARCTION. *(Por.)* Da Cunha, M.A.R.(Gen. Hosp., Souza Aguiar, Brazil), W. Akaki, F.A. Gomes and O.F. De Gouveia. *Hospital* 76(2):527-534, 1969.

206 ACUTE INTESTINAL INFARCTION. *(It.)* Angrisani, G. (Riuniti Hosp., Naples, taly) and B. B. La Rossa. *Anat Chir* 13(1-4):101-30, 1968.

- P:Absorp (0773)
- Diagproc (0947)(0966)(0980)(0981)
- D:Stomduo (1027)(1052)(1065)(1069)(1071)(1074)(1080)(1084)(1085)(1098)(1100)(1101)
- D:Stomduo:Peptulc (1115)(1120)(1123)
- D:L.Intest (1225)(1227)
- D:Livbil:Gallb (1460)(1492)
- D:Gen (1519)(1523)
- D:Gen:Parasit (1531)(1533)(1542)(1561)

1207 REGIONAL ENTEROCOLITIS (CROHN'S DISEASE). THE PANCREATIC EXOCRINE FUNCTION AFTER SURGICAL TREATMENT. *(E.)* Petersen, H. (Ulleval Hosp., Oslo, Norway), J. Myren and J. N. Hertzberg. *Scand J Gastroent* 4(7):575-580, 1969.

The secretion of fluid and bicarbonate into the duodenum in response to a submaximal i.v. dose of highly purified secretin in 8 females (ages 17 to 69 yr) and 9 males (ages 23 to 71 yr) operated on for Crohn's disease was compared with that of 15 healthy soldiers (ages 20 to 23 yr) and 12 females (ages 20 to 78 yr) and 10 male (ages 17 to 67 yr) patients without pancreatic and intestinal disorders. In patients operated on for Crohn's disease (varying degrees of resection or exclusion of the ileum and colon had been performed), 12 of them showed malabsorption but none of them showed a decreased secretion of fluid and bicarbonate in response to secretin. Males operated on for Crohn's disease secreted significantly more fluid per kg body weight than male controls and significantly greater amounts of fluid and bicarbonate in response to secretin than females (both in patients operated upon and in controls). No differences between sexes were found when relating the values to body weight. The malabsorption frequently observed in patients operated on because of Crohn's disease probably is not caused by an impairment of the pancreatic exocrine function.

1208 REGIONAL ENTEROCOLITIS (CROHN'S DISEASE): ABSORPTION STUDIES AFTER SURGICAL TREATMENT. *(E.)* Hertzberg, J. N. (Ulleval Hosp., Oslo, Norway), J. Myren and L. S. Semb. *Scand J Gastroent* 4(7):569-573, 1969.

Crohn's disease, detected preoperatively by x-ray examination, was shown by histological study of postoperative specimens to be localized in the ileum in 8 patients, in the ileum and colon in 10 patients, and in the colon in 8 patients. Absorption of vitamin A, vitamin B_{12} D-xylose, and triolein was impaired in patients with ileitis alone and patients with ileitis and colitis but not in patients with colitis alone.

1209 A CASE OF ILEITIS TERMINALIS. *(Rus.)* Mitov, F. (no affil). *Khirurgiia* 22(5):536-537, 1969.

1210 PROBLEM'S IN CROHN'S DISEASE. *(E.)* Palmer, W. L. (Dept. Med., U. Chicago, Ill.). *Guthrie Clin Bull* 39(2):58-78, 1969.

1211 UNDERNUTRITION AND SURGERY IN REGIONAL ILEITIS. *(E.)* Clark, R. G. (Roy. Infirm., Sheffield, England) and N. M. Lauder. *Brit J Surg* 56(10):736-738, 1969.

1212 INTESTINAL FLUID AND ELECTROLYTE TRANSPORT IN HUMAN CHOLERA. *(E.)* Banwell, J. G. (Johns Hopkins U. Ctr. Med. Res. Train., Calcutta, India), N. F. Pierce, R. C. Mitra, K. L. Brigham, G. J. Caranasos, R. I. Keimowitz, D. S. Fedson, J. Thomas, S. L. Gorbach, R. B. Sack and A. Mondal. *J Clin Invest* 49(1):183-195, 1970.

Fluid and electrolyte loss in the small intestine during the acute and recovery phase of cholera was studied in 27 patients by the marker perfusion technique. Isotonic fluid was lost from jejunal and ileal mucosa into the lumen (fluid loss ranged from 0.07 to 10.9 ml/hr/cm) and was greater in the jejunum. Bicarbonate content was significantly greater in the ileal fluid than in jejunal fluid and was higher in both areas in the acute phase of cholera than during the recovery phase. There was a positive correlation between jejunal fluid transport and fasting intestinal flow rate and stool excretion.

213 D-XYLOSE TEST IN THE MARASMIC TYPE OF PROTEIN-CALORIE MALNUTRITION. *(E.)* Gurson, . T. (Dept. Pediat., U. Istanbul, Turkey) and G. aner. *Helv Paediat Acta* 24(5):510-518, 1969.

arbohydrate absorption and the D-xylose test (as an ndex of intestinal absorption) were evaluated in ormal controls and infants with marasmus. The mean -hr cumulative urinary excretion of xylose, expressd as a percentage of the administered dose (15g/m^2 .o.) was 25% in normal infants and <15% in marasmic nfants. Peak blood levels of xylose 34.4±1.74 mg% control value, 48-50 mg%). The mean value for renal learance of p.o. or i.v. administered xylose was 5.65±32.3 ml/min/m^2 (similar to normal values) and he fraction of xylose absorbed from the intestine as in the range of 31.05% (approximately 50% of ormal value) of the administered dose in marasmic nfants. D-xylose test seemingly is a reliable creening method for evaluation of intestinal aborption in marasmus.

214 EFFECT OF DIFFERENT SUGARS ON DIARRHEA IN ACUTE KWASHIORKOR. *(E.)* Prinsloo, J. G. (Natl. Nutrit. Inst., Council Sci. Indust. Res., Pretoria, South Africa), W. Wittmann, P. H. Pretorius, H. Kruger and S. A. Fellingham. *Arch Dis Child* 44(237):593-599, 1969.

Bantu male infants (9 to 36 months old) with kwashiorkor were allocated at random to 1 of 6 dietary regimens representing different sugars for 13 days, to determine the relative effect on diarrhea. The patients in the groups which received lactose (as 6.3% added lactose, or 4.8% lactose in cow's milk) had initially more severe diarrhea and higher lactic acid excretion than the patients in the other groups (receiving additionally 6.3% of either glucose, sucrose, dextrin-maltose, or no sugar). Diarrhea improved in all groups, but the incidence of diarrhea and abnormal lactic acid excretion in the group receiving the 6.3% lactose formula was still high at the end of the experimental period. Those receiving cow's milk, in spite of high lactic acid excretion, did not have more diarrhea at the end of the period. There were no significant differences among the other groups. Intestinal biopsies and disaccharidase assays done on 33 patients showed a depression of all enzyme activities, especially lactase. In the Pretoria area, milk appears to be generally suitable for initiation of cure in Kwashiorkor patients. If a lactose-free formula proves to be necessary, sucrose is the logical choice, since it is easily available, inexpensive, and well tolerated.

1215 SERUM IMMUNOGLOBULINS IN KWASHIORKOR. *(E.)* Keet, M. P. (Karl Bremer Hosp., U. Stellenbosch, South Africa) and H. Thom. *Arch Dis Child* 44(237):600-603, 1969.

Serum immunoglobulin (IgG, IgA, and IgM) levels were compared in children (ages 9 to 34 months) with kwashiorkor (all with skin lesions and a variety of infections) and in apparently well-fed children (ages 7 to 34 months) suffering from similar infections. No deficiency of serum IgG or IgM levels was found in children suffering from kwashiorkor and infection while the IgA levels in both malnourished and well-fed children were higher than those reported in normal children of similar ages in the U.S.A. The serum IgA values were much higher in the kwashiorkor group, with a mean value of 152 mg/100 ml compared with 71 mg/100 ml for the well-fed cases.

1216 MULTIPLE FORMS OF DIPEPTIDASES IN NORMAL HUMAN INTESTINAL MUCOSA AND IN MUCOSA FROM CHILDREN WITH CELIAC DISEASE. *(E.)* Dolly, J. O. (Dept. Biochem., U. Coll., Galway, Ireland) and P. F. Fottrell. *Clin Chim Acta* 26(3):555-558, 1969.

Histologically normal jejunal mucosa was obtained from 8 children with subacute diarrhea (but normal fecal fat excretion and lactose tolerance curves) and from 10 gluten-fed children with celiac disease. A homogenate of the mucosa was centrifuged at 12,000g for 30 min at 2°C and the supernatant was subjected to starch gel electrophoresis. Zymograms of dipeptidases and tripeptidases from normal and celiac mucosa showed that the relative intensities of some peptidase bands were reduced in the celiac mucosa, especially when leucyl proline was the substrate. However, the number of major peptidase bands was identical in both types of mucosa when 8 different peptides were used. The decreased intensities of the bands in the peptidase zymograms of patients with celiac disease are probably attributable to secondary phenomena resulting from a morphologically abnormal mucosa.

1217 DIABETES AND COELIAC DISEASE. *(E.)* Hooft, C. (Dept. Pediat., Natl. U. Ghent, Belgium), H. Roels and E. Devos. *Lancet* II(7631):1192, 1969.

- D:Stomduo:Peptulc (1113)
- D:S.Intest (1150)
- D:L.Intest (1225)

1218 COLONIC ANASTOMOSIS: A HISTOPATHOLOGICAL STUDY IN THE RABBIT.

(E.) Garner, A. (Hope Hosp., Salford, England), A. W. Hargreaves and N. C. Keddie. *Brit J Surg* 56(9):673-676, 1969.

Histopathological examination was performed at intervals of 2 days to 3 months on resected rabbits' sigmoid colon subjected to either a double-layer inverting anastomosis, a single-layer everting anastomosis or a sleeve procedure. With the double-layer inverting procedure, necrotic mucosa began to slough away after the first week and the mucosa began to regenerate as a single layer of columnar epithelium over the surface of the granulation tissue. After 8 weeks, mucosal regeneration was complete and the anastomosed muscle layers began to unite after 3 to 4 weeks, usually with fusion of the circular and longitudinal coats. The single-layer everting anastomoses showed the same degree of necrosis and polymorphonuclear infiltration of the mucosa as the previous group, but muscle necrosis was more marked and there was more extensive granulation with a resultant union by fibrous tissue rather than by muscle layer fusion. Abscess formation was noted in 9/16 anastomoses as compared to 5/21 inverting anastomoses and in no instance was mucosal regeneration complete at 8 weeks. With the sleeve procedure, the outer cuff was essentially still intact at the end of the first week. The anastomotic union was bridged by fibrous tissue, and continuity between the muscle coats at the 2 anastomotic ends was never established. After 3 months, mucosal regeneration was still insignificant. Superior functional results with the inverting technique appeared to be due largely to the closer apposition of muscle coats and enhanced restoration of muscle continuity.

1219 THE RADIOIMMUNOASSAY OF CIRCULATING CARCINOEMBRYONIC ANTIGEN OF THE HUMAN DIGESTIVE SYSTEM.

(E.) Thomson, D. M. P. (Montreal Gen. Hosp., Quebec, Canada), J. Krupey, S. O. Freedman and P. Gold. *Proc Nat Acad Sci USA* 64(1):161-167, 1969.

A radioimmunoassay technique is described for determining the serum levels of purified I-^{125} carcinoembryonic antigen in 200 patients with cancer of the colon and rectum. Purified carcinoembryonic antigen is prepared by extraction from metastatic colonic and rectal carcinoma tissue with perchloric acid, precipitation, dialysis against water, lyophilization and redissolving in water, followed by chromatography and electrophoresis. Specific anti-carcinoembryonic antigen was obtained from goats immunized with purified carcinoembryonic antigen. Circulating levels of carcinoembryonic antigen were found only in patients with adenocarcinomata of the rectum or the colon. The single false negative result was in a patient with localized invasive polypoid adenocarcinoma of the transverse colon. In another series of 32 patients with cancer of parts of the digestive tract other than colon or rectum, circulating carcinoembryonic antigen levels were found in only 3, 2 with metastatic gastric carcinoma and 1 with metastatic adenocarcinoma of the pancreas.

1220 INTESTINAL GANGLIONEUROMATOSIS, DIARRHEA, AND MEDULLARY THYROID CARCINOMA.

(E.) Normann, T. (Inst. Gen. Exper. Path., U. Oslo, Norway) and B. Otnes. *Scand J Gastroent* 4(7):553-559, 1969.

The subject of this case report was a 15 yr old male who had suffered from diarrhea for several years. His long face and slender limbs gave him a Marfanoi appearance. There were multiple small nodules on the buccal aspect of the lower lip and on the tip o the tongue, histologically classified as mucosal ne romas. His family history was negative for diarrhe thyroid disease, pheochromocytoma, and neurogenic tumors. Ulcerative colitis was incorrectly diagnosed, and in October 1967 subtotal colectomy with ileostomy was performed. Diffuse intestinal ganglioneuromatosis was present. In April 1968 a hard tumor was found in the right thyroid lobe but thyroid function was normal. Total thyroidectomy and removal of several firm cervical lymph nodes were performed. The diagnosis was medullary carcinoma of the thyroid with regional lymph node metastases. There was no evidence of pheochromocytoma. Only 4 cases of similar intestinal pathology have previously been reported. In 3 of these the finding was associated with medullary thyroid carcinoma, pheochromocytomas, and mucosal neuromas. Diarrhea is a frequent symptom, even without intestinal ganglioneuromatosis. The diarrhea is probably secondary to biologically active substances produced by the thyroid tumor, such as 5-hydroxytryptamine and prostaglandin. This syndrome presents many interesting aspects concerning etiology, pathogenesis, diagnosis, and treatment. Recognition of one part of the syndrome should lead to investigation of the patient for other lesions, such as symptomless malignant tumors of the thyroid and adrenals. Familial occurrence has been found in some cases.

1221 CLINICAL STUDY OF MITOMYCIN C (NSC-26980) IN COLORECTAL CANCER.

(E.) Ansfield, F. J. (Div. Clin. Oncol., U. Hosp., Madison, Wisc.). *Cancer Chemother* 53(5):287-289, 1969.

Patients (23, ages 18 to 72) with advanced colorectal cancer (accurately measurable lesions) were given mitomycin C by rapid i.v. injection followin the regimen used by the Eastern Clinical Drug Evaluation Program. All patients had received prior chemotherapy with 5-fluorouracil (NSC-19893; 5-FU), or 2'-deoxy-5-fluorouridine (NSC 27640; 5-FUDR), and several had been treated with methotrexate or vinblastine. One patient had 50% or more regression with 5-FUDR and 2 had similar regressions wit 5-FU. There were no responses to vinblastine, methotrexate or mitomycin C.

1222 COMPARATIVE RESPONSE OF CARCINOMA OF THE RECTUM AND CARCINOMA OF THE COLON TO FLU RINATED PYRIMIDINE THERAPY.

(E.) Moerte C. G. (Mayo Clin., Rochester, Minn.), R. J. Reitemeier and R. G. Hahn. *Cancer Chemother* 53(5):283-285, 1969.

Patients (277) at the Mayo Clinic with advanced

adenocarcinoma of the colon (188) and rectum (89)
received rapid i.v. injection of the fluorinated
pyrimidines, 5-fluorouracil or 5-fluor-2'-deoxyuri-
dine and response to therapy was evaluated 2 months
after the start of treatment. The objective re-
sponse rate (as judged by tumor regression) for
carcinoma of the rectum was 21.4% compared to 18.6%
for carcinoma of the colon. Both compounds were
equally effective in both types of carcinomas.

223 LACTULOSE: A CLINICAL STUDY IN A CHRONI-
CALLY CONSTIPATED GERIATRIC POPULATION.
E.) Losner, I. (Leisure World, Seal Beach, Cal.).
Clin Med 76(12):24-25, 28-29, 1969.

Geriatric patients (60 female, 18 male; majority
aged 71 to 80) with chronic constipation were used
in a double-blind clinical evaluation of lactulose
(Lactulose Syrup, Philips Roxane Labs). Of 38 pa-
tients receiving lactulose, 28 reported satisfac-
tory results, with 10 failures. Of 40 remaining
patients receiving placebo, 12 reported satisfac-
tory results, with 28 failures. No abnormal values
were seen in the blood or urine analyses or in the
SGOT or blood urea nitrogen. The effective dose
for the trial drug seems to vary between 7.5 to 30
ml. The medication appears to be an effective, well
tolerated agent for the management of chronic con-
stipation in the geriatric patient. The test syrup
may be used over extended periods of time without
producing painful cramping. Tolerance does not ap-
pear to develop with extended use.

224 TUMOR ENZYME CHANGES FOLLOWING CARCINO-
STATIC THERAPY OF A HUMAN COLONIC TUMOR
IN THE GOLDEN HAMSTER. *(Ger.)* Goldenberg,
H. (Surg. Clin. Polyclin., U. Erlangen-Nuremberg,
Germany) and D. M. Goldenberg. *Enzym Biol Clin*
(Basel) 10(6):507-516, 1969.

The specific activities of glucose-6-phosphate de-
hydrogenase and lactate dehydrogenase were deter-
mined in heterotransplantable human colonic carcino-
ma maintained in the cheek pouch of hamsters treat-
ed with chronic doses of actinomycin C or cyclo-
phosphamide. Actinomycin C inhibited tumor glucose-
6-phosphate dehydrogenase activity and this effect
was dose-related and specific because hamster liver
glucose-6-phosphate dehydrogenase activity remained
unchanged. The drug also inhibited tumor lactic
dehydrogenase activity but less reliably than glu-
cose-6-phosphate dehydrogenase. Cyclophosphamide
had no inhibitory effects on glucose-6-phosphate
dehydrogenase and lactic dehydrogenase at carcino-
static doses. The enzyme inhibition by actinomycin
C may not be related to its antitumor action per se
but to its mechanism of action which involves inter-
ruption of DNA-dependent RNA-synthesis. The find-
ing that lactic dehydrogenase activity was less
markedly inhibited than glucose-6-phosphate dehydro-
genase indicates that the pentose cycle plays a more
important role in the metabolism of this neoplasm
than does anerobic glycolysis.

1225 MAJOR COLONIC PROBLEMS IN HUMAN HOMOTRANSPLANT RECIPIENTS. *(E.)* Penn, I. (U. Colorado Med. Ctr., Denver), L. Brettschneider, K. Simpson, A. Martin and T. E. Starzl. *Arch Surg* 100(1):61-65, 1970.

Colonic complications (perforation, colitis, fecal impaction, and iatrogenic laceration) occurred in 11 immunosuppressed recipients of kidney and liver homografts. In all cases (6) in which perforation or ulceration of the colon occurred, the patient died despite the fact that drug doses (particularly with steroids) were promptly and drastically reduced. Perforations of the colon were controlled either by proximal colostomy or excision of the diseased bowel and primary reanastomosis; nevertheless, death followed within a few days or weeks.

1226 APPENDICEAL PERITONITIS IN CHILDREN. A TEN-YEAR CASE MATERIAL. *(E.)* Fock. G. (Kronprinsessan Lovisa's Child. Hosp., Stockholm, Sweden), U. Gastrin and S. Josephson. *Acta Chir Scand* 135(6):534-538, 1969.

1227 INTESTINAL AMEBIASIS. *(E.)* Wilmot, A. J. (Dept. Med., U. Natal, Durham, South Africa). *Practioner* 203(1217):634-641, 1969.

1228 INTESTINAL PERFORATION, EXCHANGE TRANSFUSION, AND P.V.C. *(E.)* Rogers, A. F. (Med. Sch., Bristol, England) and P. M. Dunn. *Lancet* II(7632):1246, 1969.

1229 INTESTINAL POLYPOSIS. *(E.)* Lockhart-Mummery, H. E. (St. Thomas Hosp., London, England). *Practioner* 203(1217):620-625, 1969.

1230 FAMILIAL POLYPOSIS. *(E.)* Spargo, J. E. (Wheeling Hosp., W. Va.). *Amer J Proctol* 20(6):439-443, 1969.

1231 ACUTE APPENDICITIS IN AN INFANT YOUNGER THAN TWO YEARS OF AGE. *(Fr.)* Bienayme, J. (Surg. Clin. Child., Paris, France). *Gaz Med France* 76(28):5513-5521, 1969.

1232 URINARY AND GENITAL COMPLICATIONS AFTER RADICAL SURGERY FOR RECTO-SIGMOIDAL CARCINOMA. *(It.)* Gallizia, G. (Inst. Spec. Surg. Path., U. Turin, Italy). *J Urol Nephrol* 75(10-11):711-730, 1969.

1233 THE IRRITABLE COLON. *(Fr.)* Loizeau, E. (Cantonal Hosp., Geneva, Switzerland). *Rev Med Suisse Rom* 89(11):1033-1048, 1969.

1234 TREATMENT OF CHRONIC COLIC DIARRHEA. *(Fr.)* Fouet, P. (no affil). *Vie Med* 50(34):4215-4216, 1969.

1235 ENDOMETRIOSIS AS CAUSE OF SIGMOID OBSTRUCTION. *(Fr.)* Deroide, J. P. (Beaujon Hosp., Paris, France), A. Farah, E. Gratzmuller and H. de Fos. *Ann Chir* 23(21-22):1109-1111, 1969.

1236 RESULTS OF TWO-TEAM ABDOMINOPERINEAL AMPUTATIONS FOR RECTAL CARCINOMA. *(Fr.)* Farah, A. (Ambroise-Pare Hosp., Boulogne, France), P. Guenin and J. Etienne. *Ann Chir* 23(21-22):1103-1108, 1969.

1237 REPARATION OF DUODENAL LESIONS DURING RIGHT COLECTOMY. *(Fr.)* Juvara, I. (Cantacusino Hosp., Bucharest, Romania) and D. Radulescu. *Chir Gastroent* 3(3):367-374, 1969.

1238 CARCINOID TUMORS OF THE RECTUM. (GENERAL REVIEW WITH THREE CASE REPORTS). *(Fr.)* Malvy, P. (Fac. Med. Pharmacol., Nantes, France), G. Baudry, F. Nomballais, J. Visset, J. C. Drianno and L. LeBodic. *Ann Chir* 23(21-22):1095-1101, 1969.

1239 X-RAY DIAGNOSIS OF FIBROMA OF THE LARGE INTESTINE. *(Rus.)* Zaltsman, I. N. (Moscow, USSR) and O. A. Rostuslavina. *Vestn Rentgen Radiol* (5):97-100, 1969.

1240 X-RAY DIAGNOSIS OF ANOMALIES OF DEVELOPMENT OF THE LARGE INTESTINE IN CHILDREN. *(Rus.)* Kusch, N. L. (Donetsk, USSR), N. V. Ageev and N. N. Dzhansyz. *Vestn Rentgen Radiol* (5):100-102, 1969.

1241 GREATER PRECISION IN THE DIAGNOSIS OF DIVERTICULA OF THE LARGE INTESTINE. *(Rus.)* Labetsky, I. I. (Cuba) and K. Valdes Araucho. *Vestn Rentgen Radiol* (5):59-64, 1969.

1242 THE ROLE PLAYED BY FISTULOGRAPHY IN THE DIAGNOSIS OF RECTAL FISTULAE. *(Rus.)* Tuidzhanov, Kh. K. (Uzbekistan, USSR) and N. U. Shniger. *Vestn Rentgen Radiol* (5):64-68, 1969.

1243 THE COMPARATIVE EVALUTION OF C-REACTIVE PROTEIN AND SIALOACIDS IN DIAGNOSIS OF ACUTE APPENDICITIS. *(Rus.)* Neikov, G. N. (Tselinograd, USSR) and L. T. Kaparulina. *Vestn Khir Grekov* 103(10):67-70, 1969.

1244 SYNCHRONOUS TWO-BRIGADE OPERATIONS IN CANCER OF THE RECTUM. *(Rus.)* Meljnikov, R. A. (no affil), L. I. Sneshko and A. A. Sobolev. *Vestn Khir Grekov* 103(10):64-67, 1969.

1245 CLINICO-ROENTGENOLOGICAL CHARACTERISTICS OF DIVERTICULOSIS OF THE LARGE INTESTINE. *(Rus.)* Aizenshtat, A. I. (Riga, USSR). *Klin Med* 47(10):81-86, 1969.

1246 ATYPICAL CLINICAL PICTURE OF ACUTE APPENDICITIS IN WOMEN AGED OVER 60. *(Rus.)* Tatevosyan, A. S. (Moscow, USSR). *Sovet Med* 32(10):100-104, 1969.

1247 CLINICAL PICTURE, DIAGNOSIS AND TREATMENT OF ACUTE DISEASES OF THE COLON AND RECTUM. *(Rus.)* Zlatarski, G. (no affil.) and G. Kamenov. *Khirurgiia* 22(5):429-437, 1969.

1248 TWO CASES OF CARCINOMA OF THE COLON WITH ISOLATED VAGINAL METASTASIS. *(Fr.)* Scali, P. (Paris, France), J. Prat and O. Jurain. *C R Soc Franc Gynec* 39(3):179-184, 1969.

1249 PROBLEMS IN THE TREATMENT OF MEGACOLON CONGENITUM WITH LATE OR NON-RADICAL SURGERY. *(Ger.)* Hartmann, G. (Surg. Clin. Policlin., Friedrich Schiller U., Jena, Germany) and G. Goring *Chirurg* 40(11):517-520, 1969.

1250 CROHN'S DISEASE OF THE LARGE BOWEL. *(E.)* Douglas, E. W. (220 Alexander St., Rochester, N. Y.) and K. V. Jackman. *Surgery* 66(6): 980-985, 1969

1251 GAS GANGRENE OF ABDOMINAL WALL AFTER APPENDECTOMY. *(E.)* Roesel, R. W. (U. Illinois, Coll. Med.), D. D. O'Sullivan and T. G. Baffes. *Illinois Med J* 136(5):580-583, 1969.

1252 APPENDICEAL ABSCESS—ACUTE APPENDECTOMY OR CONSERVATIVE TREATMENT. *(E.)* Gastrin, U. (Crown Princess Lovisa's Child. Hosp., Stockholm Sweden) and S. Josephson. *Acta Chir Scand* 135(6): 539-542, 1969.

1253 PERFORATION OF THE CECUM BY BLUNT ABDOMINAL TRAUMA. *(E.)* Raffensperger, J. G. (Cook County Child. Hosp., Illinois) and G. Angress *Illinois Med J* 136(5):565-566, 636, 1969.

1254 ISOLATION OF A FETAL ANTIGEN FROM HUMAN COLONIC TUMORS. *(E.)* Von Kleist, S. (Ins Sci. Res. Cancer, Villejuif, France) and P. Burtin. *Cancer Res* 29(11):1961-1964, 1969.

1255 MASSIVE HEMORRHAGE FROM DIVERTICULOSIS OF THE COLON. *(E.)* Kellogg, C. S. (South Miami Hosp., Florida). *Amer J Proctol* 20(6):418-421, 1969.

1256 COLONIC VARICES. REPORT OF A CASE. *(E.)* Brill, D. R. (VA Hosp., Nashville, Tenn.) B. Bolasny and V. A. Vix. *Amer J Dig Dis* 14(11): 801-804, 1969.

257 ANORECTAL MYOMECTOMY IN THE TREATMENT OF SHORT SEGMENT HIRSCHSPRUNG'S DISEASE. *(E.)* issan, S. (Central Emek Hosp., Afula, Israel), . A. Bar-Maor and E. Levy. *Ann Surg* 170(6):969-77, 1969.

258 SURGERY OF NEOPLASMS OF THE LEFT COLON AND RECTUM. *(E.)* Ermini, M. (U. Rome, taly) and G. Ribotta. *J Abdom Surg* 11(12):156-161, 969.

59 LYMPHANGIECTASIA OF THE COLON WITH PROTEIN LOSS AND MALABSORPTION. *(E.)* Ivey, K. VA Hosp., Iowa City, Iowa), L. DenBesten, T. H. ent and J. A. Clifton. *Gastroent* 57(6):709-714, 969.

260 FOREIGN BODY IN THE RECTUM. *(Thai)* Tonmukayakul, A. (Siriraj Hosp., Bangkok, hailand). *Siriraj Hosp Gaz* 21(4):345-350, 1969.

261 THE PLACE OF ANTIBIOTICS IN COLONIC SURGERY: A CLINICAL STUDY. *(E.)* Everett, . T. (Welsh Natl. Sch. Med., Cardiff, Wales), T. D. rogan and J. Nettleton. *Brit J Surg* 56(9):679-684, 969.

62 DUPLICATION OF THE APPENDIX: REPORT OF A CASE. *(E.)* Willard, R. L. (Kirksville, issouri). *J Amer Osteopath Ass* 68(8):785-787, 969.

263 ADENOCARCINOMA OF THE RECTAL AMPULLA AND RECTOSIGMOID COLON: COMPARISON OF THE BDOMINO-PERINEAL AND ANTERIOR RESECTIONS FOR CURE. *E.)* Yerasimides, T. G. (Bryn Mawr Hosp., Pennsyl- ania), F. J. Fanfera, K. H. Christiansen and W. C. tainback. *Amer J Proctol* 20(6):422-428, 1969.

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1292 THE ADVANTAGES OF THE DUHAMEL OPERATION IN THE TREATMENT OF CONGENITAL AND ACQUIRED MEGACOLON. *(Sp.)* Haddad, J. (Fac. Med. U. San Paulo, Brazil), J. R. Melendez and A. A. Rai *Prensa Med Argent* 56(25):1214-1218, 1969.

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- D:S.Intest:Regent (1208)
- D:L.Intest:Ulccol (1300)
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293 MEASUREMENTS OF BLOOD AND IRON LOSS IN COLITIS WITH A WHOLE-BODY COUNTER. *(E.)* tack, B. H. (St. Mark's Hosp., London, England), . H. Jones and J. Fletcher. *Gut* 10(10):769-773, 969.

lood and iron was measured in 17 patients with lcerative colitis by estimation (with a whole-body ounter) of the fall in total body radioactivity fter i.v. administration of ^{59}Fe (as ferric ci- rate). Blood loss was generally related to the ctivity of the disease, as judged by sigmoidoscop- c appearances. Most patients with a hemorrhagic ucosa (grades III and IV) lost >200 ml of blood er week, and those with a non-hemorrhagic mucosa sually lost <200 ml per week. The grade of coli- is did not influence loss to the same extent as ctivity of inflammation. Blood losses of 50 to 50 ml per week were detected when the patients aw no blood in their stools and when the rectal ucosa did not appear hemmorrhagic. Over a period f 4 to 8 weeks, total iron loss varied from 30 mg o 1.3 g. Three patients loss >0.5 g of iron de- pite conventional treatment of colitis.

294 ON THE ABSORPTION OF PREDNISONE AND PREDNISOLONE DISODIUM PHOSPHATE AFTER ECTAL ADMINISTRATION. *(E.)* Halvorsen, S. (Ulleval osp., Oslo, Norway), J. Myren and A. Aakvaag. *cand J Gastroent* 4(7):581-584, 1969.

bsorption (measured by reduction in plasma cortisol evels) of prednisone (5 mg p.o.) was compared with hat of prednisone suspension enema (12.5 and 25 mg) nd prednisolone disodium phosphate solution enema 25 mg) in 4 patients with ulcerative colitis and 6 patients without intestinal disease. Plasma ortisol levels were reduced to a greater extent y 25 mg prednisone or prednisolone enemas than by mg prednisone. The 24-hr urinary excretion of ^{4}C-labeled prednisone was 72% of the given dose. rednisone and prednisolone appear to be resorbed rom rectal or colonic mucosa in patients with lcerative colitis.

295 THE DYNAMICS OF SOME INTESTINAL ENZYMES IN COMPLEX THERAPY (WITH INDUCTO-THERAPY) N PATIENTS WITH CHRONIC COLITIS. *(Rus.)* Kalya- ina, V. P. (Tashkent, USSR). *Vop Kurort Fizioter* 5):409-412, 1969.

296 CLINICO-MORPHOLOGICAL PARALLELS IN NON-SPECIFIC ULCERATIVE COLITIS. *(Rus.)* Mel- ikov, P. P. (Donetsk USSR), A. F. Efimtseva, V. . Gusak and Yu. V. Linevsky. *Klin Med* 47(10):86- 1, 1969.

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1299 WHEN IS SURGICAL INTERVENTION ADVISABLE IN ULCERATIVE COLITIS? *(E.)* Deckler, D. G. (Interboro Med. Plaza, Brooklyn, N. Y.). *J Amer Osteopath Ass* 67(7):774-778, 1968.

1300 DIFFERENTIATION OF ULCERATIVE COLITIS AND REGIONAL ENTERITIS OF THE COLON. *(E.)* Kent, T. H. (U. Iowa Coll. Med, Iowa City), R. K. Ammon and L. DenBesten. *Arch Path* 89(1):20-29, 1970.

1301 ILLNESS EXPERIENCE AND LIFE STRESSES IN PATIENTS WITH IRRITABLE COLON AND WITH ULCERATIVE COLITIS. *(E.)* Mendeloff, A. I. (Sinai Hosp., Baltimore, Md.), M. Monk, C. I. Siegel and A. Lilienfeld. *N Eng J Med* 282(1):14-17, 1970.

1302 THE FUNCTIONAL STATE OF THE HYPOPHYSEAL-ADRENAL SYSTEM IN NONSPECIFIC ULCERATIVE COLITIS. *(Rus.)* Gerasimov, V. K. (Leningrad, USSR). *Klin Med* 47(10):92-96, 1969.

1303 MANAGEMENT OF CONGENITAL ANORECTAL MALFORMATIONS IN INDIA. *(E.)* Taneja, O. P. (172 Rouse Ave., New Delhi, India), M. M. Sharma, A. C. Mukerji and S. Taneja. *Arch Surg* 100(1):47-54, 1970.

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1304 EARLY CHANGES IN THE EXOCRINE PANCREAS OF THE CAT DURING PERMANENT EXPERIMENTAL ISCHEMIA. *(Ger.)* Schmitz-Moormann, P. (Path. Inst., U. Marburg, Germany). *Virchows Arch Path Anat* 348(3):260-268, 1969.

The effects of partial ischemia in cat pancreas were followed at different intervals between 1 and 24 hr after interruption of the blood supply to the lienal part of the gland. Coagulation necrosis and autolysis of the acinar cells were found side by side in the center of infarction beginning at 1 hr and reaching the greatest extent at 12 hr. With progression of necrosis, pancreatic ducts and interstitial tissue of this zone were also affected. The periphery of infarction contained necrotic parenchyma with marked vacuolization of the acinar cytoplasm but the pancreatic ducts of this area were intact. The acinar cells of the adjacent non-necrotic parenchyma were degranulated in decreasing measure with their distance from the border of infarction. At 24 hr, the area of infarction was densely infiltrated by leucocytes which demarcated the zone of complete necrosis from the remaining tissue.

1305 LATE CHANGES OF THE EXOCRINE PANCREAS OF THE CAT DURING PERMANENT EXPERIMENTAL ISCHEMIA. *(Ger.)* Schmitz-Moormann, P. (Path. Inst., U. Marburg, Germany). *Virchows Arch Path Anat* 348(3):249-259, 1969.

Two days after pancreatic infarction due to vascular ligature, complete necrosis of epithelial and connective tissue was observed in the central part of the infarct. During the following days necrotic tissue was removed by polymorphonuclear leukocytes that had invaded from the infarct periphery, from intact pancreatic tissue and the peritoneal cavity. The areas of hydropic degeneration in the periphery of the infarct were resolved by proliferating connective tissue and invading leukocytes. A narrow zone of markedly eosinophilic acinar cells that contained abundant zymogen granules was present in the adjacent non-necrotic tissue. This disappeared by day 7 and simultaneously all other changes in the intact pancreas including disappearance of zymogen granules, lamellar alterations in the ergastoplasm and disseminated single necroses subsided gradually. The final stage of permanent partial ischemia was reached after 7 weeks and was characterized by a large scar at the border of infarction that contained intact pancreatic ducts.

1306 INCREASED KALLIKREIN CONTENT OF SALIVA FROM PATIENTS WITH CYSTIC FIBROSIS OF THE PANCREAS. A THEORY FOR THE PATHOGENESIS OF ABNORMAL SECRETIONS. *(E.)* Lieberman, J. (Dept. Resp. Dis., City of Hope Med. Ctr., Duarte, California) and G. D. Littenberg. *Pediat Res* 3(6):571-578, 1969.

Patients with cystic fibrosis of the pancreas and normal control subjects were studied for excessive formation or impaired inactivation of bradykinin in plasma, saliva and urine. Bradykinin, kininase and kallikrein activities were assayed by means of a modified Schultz-Dale apparatus utilizing the uterus of rats in estrus. Free bradykinin-like activity in urine, saliva or plasma from 11 patients was the same as that from 21 normal control subjects. No bradykinin-like activity was detected in the saliva and slight activity was detected in the urine of cystic fibrosis patients and control subjects. Bradykinin activity occurred in heparinized plasma of patients and subjects and was activated by salivary kallikrein. Plasma and saliva but not the urine from patients and subjects contained kininase activity which deactivated both synthetic and salivary kallikrein-induced bradykinin. Kallikrein activity was detected in the urine and saliva of patients and subjects, and was greater in the saliva of patients than of subjects. There does not appear to be a defect in the bradykinin system that could be responsible for the abnormal secretions associated with cystic fibrosis of the pancreas.

1307 PANCREATIC SCINTIGRAPHY WITH ELECTRONIC SUPPRESSION OF THE HEPATIC PICTURE. *(Fr.)* Prior, C. (Inst. Surg. Path., U. Geneva, Switzerland) and U. Valente. *Acta Chir Belg* 68(5):351-356, 1969.

1308 THE PANCREATIC SECRETIN TEST IN PATIENTS WITH LIVER PATHOLOGY. *(Sp.)* Molina, E. (Central Hosp. "Dr. Urquinaona," Maracaibo, Venezuela) and H. Santana. *GEN* 24(1):73-77, 1969.

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1311 REPRODUCTION OF IMMUNOPATHOLOGICAL PROCESS BY ADMINISTRATION OF A HOMOLOGOUS PANCREAS ANTIGEN. *(Rus.)* Velbri, S. K. (no affil). *Pat Fiziol Eksp Ter* 13(5):30-33, 1969.

1312 CLINICAL SIGNIFICANCE OF CURRENT METHODS OF DIAGNOSING THE DISEASES OF THE PANCREAS *(Rus.)* Bondar, Z. A. (no affil), S. A. Tuzhilin, A. P. Savchenko, B. A. Shlevkov and G. P. Filimonov. *Ter Arkh* (10):73-80, 1969.

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1322 THE EFFECT OF POSTGANGLIONIC SYMPATHECTOMY ON THE DEVELOPMENT OF HEMORRHAGIC PANCREATITIS IN THE DOG. *(E.)* Goodhead, B. (U. Texas, Med. Sch., San Antonio) and P. W. Wright. *Ann Surg* 170(6):951-960, 1969.

Control mongrel dogs died within 72 hr after induction of hemorrhagic pancreatitis by the injection of trypsin-digested blood into the pancreatic duct. Autopsy revealed extensive areas of hemmorrhagic necrosis, severe vasculitis of the arteries and veins with loss of elastic tissue, intraluminal thrombi in the veins, and capillary congestion and hyaline necrosis. When postganglionic sympathetic denervation of the pancreas was performed 5 to 7 days prior to induction of pancreatitis, no animals died. At sacrifice after 72 hr, these dogs had varying degrees of edematous pancreatitis and some vascular congestion but no hemorrhage or necrosis. When postganglionic sympathectomy was delayed in 5 dogs for 8 hr following injection of trypsin digested blood, 1 dog died 16 hr after sympathectomy. At the time of denervation, moderate to severe pancreatic edema and fat necrosis were evident. At sacrifice 3 dogs showed moderate to severe edema, and 1 had mild hemorrhagic pancreatitis. Pancreatic blood flow was measured using ^{86}Rb and the indicator fractionation technique. In 19 normal dogs pancreatic blood flow was 14.3 ml/min. Three and 7 days after sympathectomy, pancreatic blood flow was 23.3 ml/min (6 dogs) and 17.2 ml/min (8 dogs), resp. The increased blood flow following sympathectomy presumably prevented stasis, hemagglutination thrombi and subsequent thrombosis from developing in the pancreatic microcirculation.

1323 DUODENAL EXPLORATION IN CHRONIC PANCREATITIS. *(Sp.)* Altamira, J. (Cordoba Hosp., Argentina) and Murua, L. W. *Rev Med Cordoba* 56(56):85-93, 1969.

Nine cases of chronic pancreatitis were studied by duodenal probe in which the duodenal fluid is collected and measured both before and after the administration of ether (a stimulant used to increase exocrine activity of the pancreas). In determining the lipase (by the Bondi method) and the amylase content (by the Wislow method), it was found that the lipase was decreased in 8 of the 9 patients and that the amylase diminished in less than half (4 of the 9). The volume of duodenal content was reduced in all instances.

1324 PREVENTION OF HEMORRHAGIC PANCREATITIS WITH FIBRINOLYSIN OR HEPARIN. *(E.)* Goodhead, B. (U. Texas Med. Sch., San Antonio) and P. W. Wright. *Arch Surg* 100(1):42-46, 1970.

Dogs with acute hemorrhagic pancreatitis induced by injection of trypsin-digested blood into the main pancreatic duct were immediately given either fibrinolysin, 50,000 U, heparin, 0.5 mg/kg i.v. and 0.5 to 1.0 mg/kg s.c., or normal saline. Dogs given normal saline died within 72 hr after induction of hemorrhagic pancreatitis. At autopsy, the pancreas usually showed marked edema and extensive areas of hemorrhagic necrosis and the blood vessels showed severe vasculitis with perivascular edema, leukocyt infiltration, necrosis of the walls and loss of elastic tissue. Intraluminal thrombi were evident and capillary congestion and hyaline necrosis were common. In dogs given fibrinolysin, a mild systemi disturbance occurred during the first 24 hr, after which improvement was rapid. Pancreatic edema occurred in fubrinolysin-treated dogs but there wa no hemorrhage or fat necrosis and blood vessels we without vascular congestion or thrombi. In hepari treated dogs, vomiting was severe on the first day after administration but there was rapid improveme and no animals died. Edema and fat necrosis were common in heparin-treated dogs; intravascular thrombi were absent, elastic tissue was intact, an there was no parenchymal necrosis or hemorrhage. Inhibition of the development of hemorrhagic pancreatitis in fibrinolysin-treated dogs was due to lysis of recently-formed thrombi and in heparin-treated dogs to inhibition of thrombus formation.

1325 THE EFFECT OF BILE-INDUCED PANCREATITIS THE INTRAPANCREATIC VASCULAR PATTERN IN DOGS. *(E.)* Papp, M. (P.O. Box 67, Budapest 9, Hungary), Gy. Ungvari, P. E. Nemeth, I. Munkacsi a L. Zubek. *Scand J Gastroent* 4(8):681-689, 1969.

Hemorrhagic pancreatitis was induced in dogs with injection of bile through the duct of Santorini an the pancreatic vascular system was filled with 5% polyvinyl chloride or 3% India ink gelatin 3 and 2 hr after the injection. There was constriction of the pancreatic arteries and arterioles, failure of capillaries to fill, widening of existing arteriovenous shunts and formation of new ones, and devel ment of venous stasis. Both pancreatic edema and nervous excitement may partly cause the vascular lesions which reduce pancreatic blood flow in pancreatitis.

1326 COMPARATIVE RESULTS OF THE TREATMENT OF EXPERIMENTAL HEMORRHAGIC PANCREATITIS WITH ANTIFERMENT PREPARATIONS. *(Rus.)* Toskin, K. (no affil), P. A. Tepper, V. A. Protsenko and V. Dyadyk. *Pat Fiziol Eksp Ter* 13(5):33-37, 1969.

1327 PSEUDOTUMOR PANCREATITIS. *(Rus.)* Napalkov, P. N. (Leningrad, USSR) and M. A. Trunin. *Vestn Khir Grekov* 103(10):49-57, 1969.

1328 ACUTE PANCREATITIS IN CHILDREN. *(Rus.)* Kochnev, O. S. (no affil) and V. E. Volkov. *Vestn Khir Grekov* 103(10):95-96, 1969.

1329 BILATERAL SPLANCHNICECTOMY AND PARTIAL RESECTION OF THE CELIAC GANGLION IN CHRONIC PANCREATITIS. *(Ger.)* Wagner, E. (Giessen, Germany). *Langenbeck Arch Chir* 325:1201, 1969.

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CHANGES IN THE ACTIVITY OF THE TRYPSIN
HIBITOR OF HUMAN PANCREATIC JUICE. *(Ger.)*
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5 ACUTE PANCREATITIS WITH DUODENAL
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8 TRASYLOL IN CASES OF CLINICAL
PANCREATITIS. *(Ger.)* Grozinger, K. H.
idelberg, Germany). *Langenbeck Arch Chir* 325:
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9 THE STATUS OF TRASYLOL IN THE TREATMENT
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1340 TIME OF BILIARY SURGERY AFTER ACUTE PANCREATITIS DUE TO BILIARY DISEASE. REPORT OF SIX ILLUSTRATIVE CASES. *(E.)* Hermann, R. E. (Cleveland Clin. Ohio) and N. R. Hertzer. *Arch Surg* 100(1):71-75, 1970.

1341 PANCREATIC ABSCESS SECONDARY TO "SERRATIA MARCESCENS". *(E.)* Diethelm, A. G. (VA Hosp., Birmingham, Alabama), C. G. Cobbs and A. J. Walker. *Southern Med J* 62(12):1466-1467, 1969.

1342 TRAUMATIC PANCREATITIS. *(E.)* Ravitch, M. M. (Montefiore Hosp., Pittsburgh, Pa.) *Med Times* 98(1):196-198, 1969.

1343 ACUTE PANCREATITIS IN CHILDREN. *(E.)* Sumner, W. C. (Jacksonville, Fla.) and H. J. Hurlbut. *Trans Southern Surg Ass* 80:144-150, 1968.

1344 SURGICAL TREATMENT OF CHRONIC PANCREATITIS. *(It.)* Biancalana, L. (Fac. Med., U. Turin, Italy). *Minerva Med* 60(80):3779-3793, 1969.

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1345 AUXILIARY LIVER HOMOTRANSPLANTATION. A NEW TECHNIQUE AND AN EVALUATION OF CURRENT TECHNIQUES. *(E.)* Slapak, M. (Roy. Victoria Hosp., Montreal, Ontario), J. G. Beaudoin, H. M. Lee and D. M. Hume. *Arch Surg* 100(1):31-41, 1970.

A new technique of heterotopic liver transplantation in dogs is described in which the infrahepatic vena cava, celiac artery, superior mesenteric vein and hepatic vena cava of the donor were anastomosed to the recipient's infrarenal vena cava, iliac artery, portal vein, and vena cava, resp. The common bile duct of the host was ligated, and in 2 instances homograft function was monitored externally by a biliary fistula. Of 18 auxiliary transplants, the average survival time was 12.03 days (3 to 43 days). Following the operation, hemotocrit and serum albumin levels gradually decreased and serum bilirubin levels generally remained below 1 mg/100 ml until the third postoperative day, after which they increased. SGOT levels were generally increased after transplantation, remained normal for 2 to 6 days, then increased again before death. Serum alkaline phosphatase usually increased progressively postoperatively until death. In the 2 dogs, with biliary fistulas, bilirubin levels varied from 2 to 112 mg/100 ml until the fourth to sixth day when the previously green bile became watery and pink. At autopsy, the anastomoses were generally patent, and in all but 3 dogs the host liver weight was greater than that of the donor. The host livers showed gross gallbladder distension and they were more yellow than the brown donor livers. Microscopically, the donor liver showed a general loss of hepatocytes, effacement of normal architecture, sinusoidal congestion, portal tract infiltration and periadventitial infiltration. The host liver showed gross intrahepatic bile dilation, canaliculus proliferation, and periportal hepatocyte atrophy and necrosis.

1346 EFFECT OF HEPATOCARCINOGENS ON HEPATOCYTE D.N.A. SYNTHESIS AND CORTISONE INDUCTION ON TRYPTOPHAN OXYGENASE. *(E.)* Kizer, D. E. (Biomed. Div., Samuel Roberts Noble Foundation, Inc., Ardmore, Okla.), B. Cox, B. A. Howell and B. C. Shirley. *Cancer Res* 29(11):2039-2046, 1969.

Increase in adenosine monophosphate (AMP) deaminase activity in precancerous livers were correlated with proliferation of hepatic parenchymal cells in rats fed thioacetamide, or the 3'-methyl (3'-Me), 4'-methyl (4'-Me), and the 4'-fluoro (4'-F) derivatives of 4-dimethylaminoazobenzene (DAB). Proliferation among parenchymal cells was assessed by radioactive determination of DNA synthesis or by inhibition of cortisone induction by tryptophan oxygenase. Thioacetamide, 3'-Me-DAB and 4'-F-DAB increased hepatocyte DNA synthesis, inhibited cortisone induction of tryptophan oxygenase, and stimulated hepatic AMP deaminase activity. 4'-F-DAB, when fed with diet containing moderate riboflavin levels, is not hepatocarcinogenic and did not stimulate hepatocyte DNA synthesis or hepatic AMP deaminase acitivity. Injection of thioacetamide or 3'-Me-DAB also stimulated hepatocyte DNA synthesis, inhibited tryptophan oxygenase induction and sti
ulated AMP deaminase activity.

1347 SERUM ZINC LEVELS IN HEPATOCELLULAR CARCINOMA. *(E.)* Dunn, J. A. (Depts. Chemical Path. Med., U. Witwatersrand, Johannesburg, South Africa), M. C. Kew, J. D. Taylor and R. C. Mallet. *Brit J Cancer* 23(3):634-637, 1969

Serum zinc determination using an atomic absorpt
spectrophotometer were made in 40 Bantu control
patients convalescing from non-hepatic disorders
and in 31 Bantu males with histologically proven
malignant hepatomas. Medication consisted only
penicillin injections. Mean serum zinc levels f
the hepatoma patients was 139 mcg% and in the co
trol group 100.5 mcg% (not statistically signifi
cant). In four of the hepatoma cases, elevated
values (205-350 mcg%) were encountered. There w
no correlation between serum zinc levels and can
therapy.

1348 VASCULAR CHANGES WITHIN THE LIVER IN BILIARY OBSTRUCTION. *(E.)* Aronsen, K. (Malmo Gen. Hosp., Sweden), J. G. Norden, B. Nosslin, G. Nylander and E. G. Ohlsson. *Acta Ch*
Scand 135(6):505-510, 1969.

Angiographic, isotope and cast techniques were
to study the influence of biliary stasis on the
liver vascular bed in dogs. After 14 days of bi
iary stasis there was a significant reduction in
transit time of contrast medium (urographin) thro
the liver and after 21 and 42 days there was delayed passage through the liver of both barium s
fate and ^{99m}Tc-tagged iron particles. Sinusoida
dilation was less than 20µ at 21 days of biliary
stasis and greater than 20µ at 42 days.

1349 HEPATOMEGALY IN CHILDREN—I: CLINICAL AND EPIDEMIOLOGIC CONSIDERATIONS. *(E.)* Sharma, S. K. (Med. Coll., Jabalpur, India), J. Mukherji, R. K. Taluja and K. K. Kaul. *Indian Pediat* 6(6):383-390, 1969.

Hepatomegaly was studied in Indian children with
respect to socio-economic, environmental and cli
cal patterns. In a 5 month period, 162 of 750
children admitted to a children's hospital had
hepatomegaly with liver enlargement >3 cm below
costal margin. In a separate analysis of 1000
children with palpable liver, 38.5% had liver en
largement of >3 cm below the costal margin. The
was a preponderance of male children, particular
up to 6 yr of age and most children belonged to
lower middle or poorest classes. Of 108 childre
hepatic cirrhosis was the cause of hepatomegaly
70.9% of the 55 lower middle class patients and
86.9% of the 23 children from the Baniya communi
A varying degree of malnutrition was present in
of the children. Of 100 clinically examined chi
dren, a diagnosis of hepatic cirrhosis was made
51.8%, infections in 20%, malnutrition in 17% an
anemia in 5.5%. This is similar to the separate

alysis of 1000 children in which cirrhosis, malnutrition, infectious hepatitis, anemia, leukemia d indeterminate hepatomegaly were found.

50 SERUM α_1-FETOPROTEIN IN PATIENTS WITH LIVER DISEASE.

(E.) Foli, A. K. (Ghana d. Sch., Accra, Ghana) and S. Sherlock. *Lancet* (7633):1267-1269, 1969.

rum from 262 adult patients with various types of ver disease was examined for α_1-fetoprotein using munodiffusion techniques. The fetoprotein (0.2 150 mg/100 ml) was detected by both double difsion in agar gel and immunoelectrophoresis in the rum of 14 of 35 patients with primary hepatocellar carcinoma. The fetoprotein was absent in tients with secondary carcinoma of the liver, rcinoma of the bile ducts, hemangioma and benign ver adenoma. Histological examination of the mors did not reveal any features which would differentiate α_1-fetoprotein-positive and -negative tients and there was no correlation between posive sera and cirrhosis. The presence or amount of fetoprotein in the serum was not related to the ze of the tumor. When the hepatocellular carcina patients were analyzed with respect to geoaphic origin, 5 of 17 British patients, 5 of 8 st Africans and 4 of the remaining 10 patients m various localities were positive for the α_1-oprotein, suggesting that regional differences exist in the frequency of positive α_1-fetoproin tests in patients with hepatocellular carcino-

1 ACTIVITIES OF δ-AMINOLEVULINIC ACID SYNTHETASE IN THE LIVER AND BONE MARROW OF ATIC COPROPORPHYRIA (HEREDITARY COPROPORPHYRIA).

) Sasaki, H. (Nigata U. Sch. Med., Japan), K. eko and H. Tsuneyama. *Acta Med Biol (Niigata)* (2):97-99, 1969.

ee case histories are presented in which the abolic abnormality of hepatic coproporphyria reditary coproporphyria) was studied in the ver and bone marrow. Delta-aminolevulinic acid A) synthetase activity of porphyric liver mitondria was markedly increased and ALA dehydrase ivity was slightly increased when compared to trol liver. ALA synthetase activities of bone row were within normal limits and erythrocyte phyrin levels remained normal in both relapse remission. Increased production of porphyrins precursors of this type of porphyria is possidue to increased ALA synthetase activity in the er and not from bone marrow.

2 THE VASCULARIZATION OF BROWN-PEARCE CARCINOMA IMPLANTED IN RABBIT LIVER.

(E.) vas, A. A. (Dept. Path., U. Edinburgh, Scotland) W. J. Gillespie. *Brit J Cancer* 23(3):638-643, 9.

cularization of implanted Brown-Pearce carcinoma o livers was studied in rabbits utilizing an intion technique (with fresh neoprene latex) which produces a three-dimensional cast which is studied under a dissecting microscope. Brown-Pearce carcinoma implanted in liver received blood supply from the hepatic artery when circulation was studied 10 to 21 days after implantation. Perfusion through the portal vein produced a cast which revealed the site of growth as a "filling defect," however, there was evidence of a marginal connection with the portal circulation following simultaneous perfusion through hepatic artery and portal vein.

1353 SYSTEMATIC OSCILLATIONS IN METABOLIC ACTIVITY IN RAT LIVER AND HEPATOMAS: EFFECT OF HYDROCORTISONE, GLUCAGON, AND ADRENALECTOMY ON DIPLOID AND OTHER HEPATOMA LINES.

(E.) Watanabe, M. (Res. Inst. T. B., Leprosy and Cancer, Tokohu U., Sendai, Japan), V. R. Potter, G. C. Pitot and H. P. Morris. *Cancer Res* 29(11):2085-2100, 1969.

The effects of hydrocortisone, glucagon and adrenalectomy on activities of tyrosine-α-ketoglutarate transaminase, serine dehydratase, glucose-6-phosphate dehydrogenase, citrate cleavage enzyme and glucose-6-phosphate in hepatomas and the host livers were studied in Buffalo strain rats with Morris hepatomas 9618A, 9633, 7800 or 5123C. Hepatomas with diploid chromosome number were compared with normal rat liver in their response to hormonal treatments. The enzyme activity of Hepatoma 7800 was increased significantly by hydrocortisone, was decreased by adrenalectomy and was unchanged by glucagon treatments. Hepatoma 9633 was unchanged by treatment with hydrocortisone or glucagon, or by combination of both. Combined treatment with hydrocortisone and glucagon resulted in increased activity of tyrosine transaminase in hepatoma 9618A and adrenalectomy decreased the enzyme activities in hepatoma 5123C. Enzyme activities in each hepatoma line seemingly respond differently to hormonal treatments, but the enzyme patterns after hormonal manipulation could be related to the range of activities observed on normal rat liver at different developmental stages.

1354 MITOTIC INDEX IN THE REGENERATING LIVER OF TUMOR-BEARING MICE.

(E.) Theologides, A. (U. Minnesota Hlth. Sci. Ctr., Minneapolis) and G. F. Zaki. *Cancer Res* 29(11):1913-1915, 1969.

The time of onset and rate of mitosis of tumor-free liver, regenerating after partial hepatectomy, were studied in C3H (Bittner Z) mice bearing a transplanted mammary carcinoma and in control animals. Presence of a tumor elsewhere in the body affected the time of onset and rate of regeneration in the remaining liver following partial hepatectomy. In tumor-free animals, the rise in the number of mitoses occurred 48 hr after partial hepatectomy, while in tumor-bearing mice, a significant increase in the number of mitoses occurred at 30 hr and the mitotic index kept rising for up to 42 hr. Highest mitotic activity for both groups occurred at 48 hr and then the mitotic index started declining. No significant difference in mitotic index of the two groups was observed from 48 to 60 hr posthepatectomy. The mitotic index of the tumor remained at the presurgery level for the first 12 hr following partial hepatectomy and at 18 hr the mitotic index dropped markedly, subsequently started rising and reached the initial level at 48 hr.

1355 ETHANOL IN PREVENTION OF HYPERBILIRUBINEMIA IN THE NEWBORN: A CONTROLLED TRIAL. *(E.)* Waltman, R. (Brooklyn-Cumberland Med. Ctr., New York). G. Nigrin, F. Bonura and C. Pipat. *Lancet* 2(7633): 1265-1267, 1969.

Ethanol, 100-115 g i.v., was administered to 26 near-term and term pregnant women from 3 to 96 hr before delivery, to determine the effects on bilirubin levels in the newborn infant during the first 5 days of life. Serum bilirubin levels were significantly decreased from control values (5.94 to 6.88 mg/100 ml) during the third, fourth and fifth days of life in newborn infants whose mothers were treated with 115 g of ethanol 3 to 96 hr prior to delivery. Ethanol may be useful in preventing hyperbilirubinemia in newborn infants.

1356 OBSCURE HEPATOMEGALY: A CLINICO-PATHOLOGICAL STUDY. *(E.)* El Mehairy, M. M. (Depts. Med. Path., Ain-Shams U., Cairo, Egypt), O. Attia, I. Nassar, N. M. El Tarabeeshy and A. E. Nabih. *J Trop Med Hyg* 72(10):241-246, 1969.

1357 CHOLECYSTOKININ AND THE CYSTIC DUCT SYNDROME: CLINICAL EXPERIENCE IN A COMMUNITY HOSPITAL. *(E.)* McFarland, J. O. (Scottsdale, Arizona) and J. Currin. *Amer J Gastroent* 52(6): 515-522, 1969.

1358 SERUM TRANSAMINASE ELEVATIONS AND OTHER HEPATIC ABNORMALITIES IN PATIENTS RECEIVING ISONIAZID. *(E.)* Scharer, L. (133 E. 64th St., New York, N. Y.) and J. P. Smith. *Ann Intern Med* 71(6):1113-1120, 1969.

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1360 GASTROGENIC DIARRHEA AND GASTRIN. *(Sp.)* Freytes, M. A. (Nat. U. Cordova, Spain) *Rev Med Cordoba* 56(56):94-97, 1969.

1361 ALTERATIONS IN THE ACID-BASE EQUILIBRIUM IN LIVER DISEASE: INITIAL OBSERVATIONS IN 25 CASES. *(Por.)* Da Silva, J. A. F. (Med. Fac., U. Fed. Rio De Janeiro, Brazil), A. G. de S. Filho, A. Buescu and H. S. de A. Falcao. *Hospital* 76(3): 827-835, 1969.

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J. T. Blanco, E. Lowenberg and J. A. Nunez. *Gin*
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POLYGLOBULISM RESEMBLING A HEPATIC TU
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1364 STUDIES ON THE ISOLATED ANIMAL LIVER
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P. Bozek. *Przegl Lek* 25(6):497-499, 1969.

1365 INTRAHEPATIC CALCIFICATION IN THE NEWBORN. *(Fr.)* de Keyzer, L. (Clin. Pedi
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1366 BILIARY DUCT MORPHOLOGY IN INTRAOPERATIVE CHOLANGIOGRAPHY. *(Ger.)* Bergerhof, H. D. (St. Hosp. Rhine, Germany). *Fortsch*
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SEVERE TRAUMATIC LESIONS OF THE LIVER
(It.) Preziosi (Central Hosp., Rome, Italy).
Chir Gastroent 3(3):324-333, 1969.

1368 CONTENT OF PYRIDINE NUCLEOTIDES IN LI
MITOCHONDRIA OF IRRADIATED RATS. *(Rus*
Smirnova, T. N. (no affil), G. M. Svischev and
F. Romantsev. *Radiobiologiia* 9(5):751-754, 196

1369 FUNCTIONAL HYPERBILIRUBINEMIAS IN CHILDREN. *(Rus.)* Malakhovsky, Yu.
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N. A. Ledak, V. D. Ustyantseva, R. V. Tupitsin
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METHOD FOR ASSESSMENT OF THE INFORMAT
VALUE OF SOME BIOCHEMICAL TESTS IN CHRONIC DIFF
AFFLICTION OF THE LIVER. *(Rus.)* Blyuger, A. F.
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A. B. Raitsis. *Ter Arkh* (10):81-85, 1969.

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1388 A CASE OF HOMOLOGOUS LIVER TRANSPLANTATION. *(E.)* Gutgemann, A.(Dept. Surg., U. Bonn, Germany), K.H. Schriefers, G. Esser, T.S. Lie, K.J. Paquet and C. Kaufer. *German Med Monthly* 14(11): 525-528, 1969

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1392 LOW PLASMINOGEN LEVELS AND LIVER DISEASE. *(E.)* Davis, R.D.(Dept. Path., U. Vermont, Burlington) and R.C. Picoff. *Amer J Clin Path* 52(6): 661-665, 1969.

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- D:S.Intest (1153)
- D:Livbil:Cirrh (1444)
- D:Gen:Parasit (1539)(1540)(1541)(1560)(1561)

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large PAS-positive globules that developed in
cytoplasm of the liver parenchymal cells of four
s poisoned with sub-lethal doses of heliotrine
e shown by electron microscopy to be giant lyso-
es. These lysosomes are concerned with the de-
dation of material taken in by endocytosis and of
tions of the cell's own cytoplasm. Degenerative
nges in the segregated organelles often resemble
se found in shrinkage necrosis or in coagulative
rosis. Some compound bodies may result from
ion of various types of digestive vacuoles, or
ge vacuoles may engulf pieces of the adjacent
oplasm.

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Kliman, A. (Massachusetts Red Cross Blood
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enty-eight proven cases of post transfusion hepa-
is in patients who received 1 or more units (U)
blood from the Massachusetts Red Cross Blood
ter were reported during the period July 1, 1966
ough June 30, 1969. The 78 patients received a
al of 557 U of blood, 46 U of which were Red
ss packed red cells (only 1 patient received
ked red cells alone). During the same 3-yr pe-
d, Massachusetts hospitals reported transfusing
roximately 450,000 U of whole blood and 98,000 U
packed red cells. Of this blood supply, the
sachusetts Red Cross supplied approximately
,000 U of whole blood and 48,000 U of packed
cells. The trend over the 3-yr period has
m a definite decrease in hepatitis cases re-
ted as the number of packed red cells distribu-
increased. At the same time the level of in-
tious hepatitis in the general community has
rising and is currently at its 7-yr peak.

HEMOBILIA ASSOCIATED WITH HEPATIC NECROSIS
AFTER HALOTHANE ANAESTHESIA. *(E.)*
ela, V. (2nd Dept. Path., U. Helsinki, Finland)
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1407 DIFFERING HEPATIC LESIONS CAUSED BY THE SAME DOSE OF ULTRASOUND. *(E.)* Taylor, K. J. W. (Guy's Hosp. Med. Sch., London, England) and C. C. Connolly. *J Path* 98(4):291-293, 1969.

1408 MASSIVE LIVER TRAUMA INVOLVING THE SUPRA-RENAL VENA CAVA. *(E.)* Albo, D., Jr. (U. Utah, Coll. Med., Salt Lake City), C. Christensen, B.L. Rasmussen and T. C. King. *Amer J Surg* 118(6):960-963, 1969.

1409 TOXIC HEPATITIS. *(Fr.)* Sicot, C. (Hosp. Beaujon, Clichy, France), C. Bismuth, J. P. Frejaville, P. Berthelot, B. Rueff and J. P. Benhamou. *Rev Franc Etud Clin Biol* 14(2):192-212, 1969.

1410 GONOCOCCAL PERIHEPATITIS SIMULATING ACUTE CHOLECYSTITIS. *(E.)* Trimble, C. (Denver Gen. Hosp., Colorado). *Surg Gynec Obstet* 130(1): 54-56, 1970.

1411 MANAGEMENT OF HILAR INJURY OF THE LIVER. *(E.)* Hanna, W. A. (City Hosp., Belfast, Ireland) and J. D. Wisheart. *J Roy Coll Surg Edinb* 14(6):328-332, 1969.

1412 SURGICAL EXPLORATION OF THE JAUNDICED PATIENT. *(Dut.)* Hendricks, J. (U. Clin. St. Rafael, Leuven, Belgium), J. Beckers, G. Fransen and F. Trimpeneers. *T Gastroent* 12(4):359-378, 1969.

1413 ACUTE, FEBRILE, ICTEROGENIC HEPATITIS OF UNCOMMON ETIOLOGY. *(Por.)* De Macedo, A. G. (Surg. Clin. St. Joao de Deus, Rio De Janeiro, Brazil) and E. C. Antonio. *Hospital* 76(3):1125-1136, 1969.

- P:Secr:Hepatobil (0855)(0856)(0858)
- Diagproc (0978)
- D:Gen:Parasit (1535)(1545)(1560)

EFFECTS OF EARLY AND VIGOROUS EXERCISE ON
RECOVERY FROM INFECTIOUS HEPATITIS. *(E.)*
born, R. K. (Walter Reed Army Med. Ctr.,
ington, D. C.) and L. H. Repsher. *New Eng J*
281(25):1393-1396, 1969.

effect of vigorous exercise on recovery time
infectious hepatitis was studied in 398 Ameri-
servicemen alternately assigned to rest or ex-
se groups. The patients all had elevated serum
rubin and SGOT and had not received recent
d transfusions. The exercise group of 199 pa-
ts was started on a 3 hr a day program of
uous activity at the time their symptoms were
idered slight, regardless of the degree of
r-function abnormality. Their mean serum bili-
n at the start of the exercise program was
mg%. The activity of the rest group was re-
cted, but they were allowed freedom of the ward
had no required rest periods. No significant
erence was found between the 2 groups in the
tion of illness (serum bilirubin elevation).
e patients with a maximum serum bilirubin of
mg% had a significantly longer duration of
ess, but exercise did not effect that duration.
e patients over 30 showed no adverse effect
exercise. No difference in the duration of
ess was found in those involved in light activ-
at the time of onset of illness as compared to
e involved in strenuous activity. Subjective
ical relapse occurred in 39% of the rest group
4% of the exercise group; but biochemical re-
e (as judged by SGOT and serum bilirubin
ls) occurred in 16% and 15% of the rest and
ise groups, resp. In one-third of the cases,
was still elevated when serum bilirubin had
rned to normal. Strenuous exercise does not
to affect adversely the acute course of infec-
hepatitis in previously healthy young men.

THE GLUCAGON TEST AS AN INDEX OF HEPATO-
CELLULAR REPARATION IN ACUTE VIRAL HEPA-
. *(Sp.)* Ferrari, O. (Pediat. Hosp., Buenos
, Argentina), R. Straface, H. Mondino, F. Isasa
. Games. *Arch Argent Pediat* 66(7-9:259-268,

lucagon Test was studied in 6 normal children,
ildren (ages 2 to 8) with acute viral hepati-
and a number of hepatitis patients in the re-
ative stages. After 6 hr of fasting, an ini-
capillary blood sample was taken then, after
v. injection of glucagon, blood samples were
rawn at 10 min intervals. The blood glucose
s after fasting were 0.90g/1000 ml in normal
ren, 0.78g/1000 ml in children with hepatitis,
.88g/1000 ml in recuperating hepatitis patients.
verage glycemia increase after 30 min was 64%
ormal children, 37% for children with acute
itis, and 73% for recuperating patients. The
gon Test offers the possibility of evaluating
lycogenolytic capacity of the liver in hepati-
nd is specific and lacks undesirable side
ts.

1416 RELATIVE EFFICACY OF TRITHIOPARAMETHOXYPHENYL PROPENE AND VITAMIN B_{12} IN INFECTIOUS HEPATITIS. *(E.)* Jain, S.M. (M.G.M. Med. Coll., Indore, India) and A. Hussain. *Indian Pract* 22(9):539-542, 1969.

The efficacy of trithioparamethoxyphenyl propene (Hexasulfol), 12.5 mg p.o., and vitamin B_{12}, 100 µg i.m., were compared in 23 patients with infectious hepatitis. Reduction in serum bilirubin levels and thymol turbidity and alkaline phosphatase tests were similar in both groups of patients. Clinical improvement (measured by return of appetite, sense of well-being and disappearance of hepatic region pain and tenderness) was similar in both groups of patients but when administered with cortisone, vitamin B_{12} was more effective than Hexasulfol.

1417 EFFECT OF ZINC SULPHATE ON CARBON TETRACHLORIDE HEPATOTOXICITY. *(E.)* Srinivasan, S. (B. J. Med. Coll., Poona, India) and J. H. Balwani. *Acta Pharm* 27(6):424-428, 1969. 428, 1969.

Pre-treatment of rats with zinc sulphate (2 mg/kg i.p.) had no effect on the extent of liver cirrhosis produced by carbon tetrachloride (2.5 ml/kg s.c.) administered 5 hr later. Bromsulfphthalein excretion and succinic dehydrogenase activity were significantly less impaired than in the untreated rats. Prolonged hexabarbitone sleeping time was not significantly affected by pretreatment with zinc sulfate.

1418 PRESYMPTOMATIC DIAGNOSIS OF HEPATITIS. *(E.)* Del Prete, S. (Inst. Clin. Med., U. Milan, Italy), D. Contantino and M. Doglia. *Lancet* II (7632):1250, 1969.

1419 REST AND EXERCISE IN HEPATITIS. *(E.)* Chalmers, T. C. (no affil). *New Eng J Med* 281(25): 1421-1422, 1969.

1420 THE SOCIAL IMPACT OF LIVER DISEASE. *(E.)* Popper, H. (Mount Sinai Sch. Med., New York, N.Y.), C. S. Davidson, C. M. Leevy and F. Schaffner. *New Eng J Med* 281(26):1455-1458, 1969.

1421 VIRAL HEPATITIS. AN ANALYSIS OF NOTIFICATIONS RECEIVED FROM AN ARMY COMMAND DURING JUNE 1966 TO DECEMBER 1967. *(E.)* Sanyal, M. C. (Advisor in Preventive Med., Headquarters, Western Command, Simla, India). *Indian J Med Res* 57(7): 1325-1332, 1969.

1422 ON THE MECHANISM OF PROPHYLACTIC ACTION OF γ-GLOBULIN IN INFECTIOUS HEPATITIS. REPORT I: SOME INDICES OF NONSPECIFIC IMMUNITY IN CHILDREN VACCINATED WITH VARIOUS DOSES OF γ-GLOBULIN. *(Rus.)* Vaserin, Yu. I. (no affil), N. P. Medelko, A. B. Beresneva and Zh. A. Volkova. *Zh Mikrobiol* 46(10):77-80, 1969.

1423 SOME INDICES OF THE BLOOD COAGULATION AND ANTITHROMBIN ACTIVITY IN PROTRACTED FORMS OF INFECTIOUS HEPATITIS. *(Rus.)* Dorofeyeva, R. P. (Lugansk, USSR). *Vrach Delo* (10):102-104, 1969.

1424 A DISTURBANCE OF ESTROGEN CONJUGATION IN WOMEN SUFFERING FROM INFECTIOUS HEPATITIS. *(Rus.)* Yatsenko, L. A. (no affil). *Akush Ginec* 45(10):35-38, 1969.

1425 A CASE OF RECOVERY FROM ACUTE DYSTROPHY OF THE LIVER IN SERUM HEPATITIS. *(Rus.)* Bashdurov, E. P. (no affil) and V. G. Rysich. *Klin Med* 136-137, 1969.

1426 BLOOD GROUPS IN PATIENTS WITH VIRAL HEPATITIS. *(Pol.)* Chrominska, H. (Clin. Lodz, Poland), B. Rosiek and L. Tomaszewska. *Pol Arch Med Wewnet* 43(4):1353-1358, 1969.

1427 METHODS OF IMPROVING THE QUALITY OF PROPHYLAXIS OF INFECTIVE SERUM HEPATITIS. *(Rus.)* Dubovsky, V. G. (no affil). *Zh Mikrobiol* 46(10):106-108, 1969.

1428 INFECTIOUS HEPATITIS IN PREGNANCY AND PUERPERIUM-A STUDY OF 60 CASES. *(E.)* Rao, A. V. N. (Kurnool Med. Coll., India), C. S. Devi, P. Savithri and E. Seshirekha. *Indian J Med Sci* 23(9):471-478, 1969.

1429 VIRAL HEPATITIS, POSTNECROTIC CIRRHOSIS, AND HEPATOCELLULAR CARCINOMA. *(E.)* Smith, J. B. (Inst. Cancer Res., Philadelphia, Pa.) and B. S. Blumberg. *Lancet 11* (7627):953,1969.

1430 HAS THE HEPATITIS VIRUS BEEN DISCOVERED? *(Sw.)* Nordenfelt, E. (Dept. Med Microbiol., U. Lund, Sweden). *Lakartidningen* 66(47): 4877-4882, 1969.

1431 ELECTROCARDIOGRAPHIC CHANGES IN VIRAL HEPATITIS AND THEIR CORRELATION WITH THE LEVELS OF SERUM BILIRUBIN AND TRANSAMINASES. *(E.)* Das, K. M. (Calcutta Natl. Med. Coll., India) and Das, P. C. *Indian Heart J* 21(1):105-113, 1969.

1432 MANAGEMENT OF HEPATITIS. *(E.)* Wang, R. I. H. (Marquette Sch. Med., Milwaukee, Wisc.) and O. O. Meyer. *Wisconsin Med J* 8(11): 344-346, 1969.

1433 SOME FACTORS REGULATING DURATION OF INCUBATION FOR SERUM HEPATITIS. *(E.)* Allen, J. G. (Stanford U. Sch. Med., Palo Alto, Calif.). *Arch Surg* 100(1):2-5, 1970.

1434 SOME OBSERVATIONS ON THE STUDY ON SERUM PHOSPHOGLUCOSE ISOMERASE IN HEALTH AND IN DISEASES OF LIVER. *(E.)* Pai, M. L. (Med. Coll., Baroda, India). *Indian J Physiol Pharmacol* 13(1): 77-78, 1969.

1435 VIRAL HEPATITIS THERAPY. *(It.)* Pasini, G. (No affil). *Minerva Med* 60(87):4358-4359, 1969.

1436 INFECTIOUS HEPATITIS IN A CHILD. *(Sp.)* Torres, H. E. (United Region. Hosp. Mar del Plata, Spain), A. Rubinstein, S. Braslavsky, R. Balado and F. De Schant. *Arch Argent Pediat* 66(7-9):242-246, 1968.

1437 TREATMENT OF HEPATITIS. *(Nor.)* Lange, H (Krohgstotten Hosp., Oslo, Norway). *T Norske Laegeforen* 89(22):1739-1744, 1969.

- P:Morph (0753)

8 TREATMENT OF CHRONIC HEPATITIS AND CIRRHOSIS WITH THE ORAL ANTIDIABETIC AGENT, .BUTAMIDE (ORABET). *(Ger.)* Schimmelpfennig, W. [. Med. Clin., Humboldt U., Berlin, Germany), Wagner, G. Schneider, D. Theuer, R. iimmelpfennig, H.-B. Zimmerman and A. Hecht. *itsch Gesundh* 24(44):2074-2079, 1969.

: potential therapeutic action of tolbutamide,) g/day, was followed for 6 to 12 months in 23 :ients with chronic persistent and chronic pro- essive hepatitis and liver cirrhosis. The para- :ers of evaluation included clinical condition, ly weight, liver and spleen size, liver biopsies, :aline phosphatase, serum transaminases, BSP re- ntion, bilirubin and urobilinogen. In the major- y of patients these criteria remained constant l some parameters improved, most notably body ight, serum iron, BSP retention and urobilinogen. patic histology was unchanged or improved in 75% the cases. Five patients with chronic progres- ve hepatitis experienced further deterioration ring tolbutamide therapy as judged by cholestasis ndrome and liver cytology. Side effects in the rm of transient hypoglycemic reactions occurred ly in isolated instances. Tolbutamide may be dicated in benign forms of chronic hepatitis but eds to be evaluated in larger numbers of patients sessed by uniform criteria of diagnosis and thera- utic response.

9 PERSISTENT VIRAL HEPATITIS. *(Fr.)* Bereni, J. (Marseilles, France), C. astel, C. Desmerges and J. Goasguen. *Presse Med* (47):1713-1715, 1969.

- D:Livbil (1370)(1371)
- D:Livbil:V.Hep (1434)

1440 THE PRODUCTION OF BILIARY CIRRHOSIS IN *MACACA MULATTA* MONKEYS. *(E.)* Rutherford, R. B. (601 N. Broadway, Baltimore, Md. 21205), J. K. Boitnott, J. S. Donohoo, E. G. Ohlsson, J. Sebor and G. D. Zuidema. *Arch Surg* 100(1): 55-60, 1970.

Biliary cirrhosis, preceded by persistent obstructive jaundice and progressive hepatic fibrosis and followed by portal hypertension, was produced by total excision of the extrahepatic biliary tree in monkeys. A marked degree of fibrosis developed within 2 to 4 months of onset of biliary obstruction and all monkeys surviving over 6 months showed histologic evidence of cirrhosis with a marked increase in portal pressure. A significant histologic feature in the cirrhotic monkeys was the appearance of fibrovascular septa between portal triads and central veins.

1441 CONCLUSIONS FROM A CONTROLLED TRIAL OF THE PROPHYLACTIC PORTACAVAL SHUNT. *(E.)* Callow, A. D. (Tufts U. Sch. Med., Medford, Mass.), T. C. Chalmers, A. M. Ishihara, A. J. Garceau and E. T. O'Hara. *Surgery* 67(1):97-103, 1970.

During a 10 yr period, 93 patients with moderate to advanced liver cirrhosis and esophageal varices which had not bled were randomly treated by medical therapy (45 patients) or prophylactic portacaval shunt (48 patients). The postoperative mortality rate was 2% at 30 days and 10% at 90 days. Five (10%) of the medically-treated patients died from variceal bleeding, in contrast to 1 surgical patient. The shunt exerted a beneficial effect on the size of varices, reduction of portal pressure and the prevention of esophageal hemorrhage, but it did not improve longevity. The incidence of encephalopathy was 52% in the surgical patients and 37% in the medically treated patients. The severity of encephalopathy was also significantly less in the medically treated patients. The frequency and severity of ascites in the 2 groups was not significantly different. Six new cases of peptic ulcer occurred in the surgical group and 4 new cases in the medical group. Abstinence from alcohol did not significantly improve survival rate among the unshunted patients, but it appeared to exert a beneficial effect in lessening ascites and lowering the incidence of bleeding. Retrospective analysis was unsuccessful in identifying clinical factors which might predispose to variceal hemorrhage. Prophylactic portacaval shunt is not effective for patients with poor nutritional habits and alcohol cirrhosis.

1442 DISACCHARIDE INTOLERANCE AND INDIAN CHILDHOOD CIRRHOSIS. PART II. SURVEY OF THE FAMILIES FOR MALTOSURIA. *(E.)* Dhatt, P. S. (Med. Coll., Rohtak, India), H. Singh and H. L. Gupta. *Indian J Med Res* 57(7):1282-1286, 1969.

Parents and available siblings of 18 children (16 males and 2 females, 1 to 3 yr old) suffering from Indian childhood cirrhosis were examined for maltosuria. Urinary excretion of sugars was studied by paper chromatography before and after an oral loading dose of maltose. Both parents excreted maltose in 2 families, and 1 parent had maltosuri in 6 other families. Three of the 8 elder siblin (from 3 families) also excreted maltose. Maltosuria was detected in 13 of the 18 patients in a fasting state, and in 3 others after a loading do of maltose. A control group of 6 adults and 7 children showed no maltosuria. Sucrosuria was present in 13 of 18 patients (11 of which also ha maltosuria) and in several family members. Lactose, galactose, glucose and fructose were also detected in the urine of some of the patients and their families. Maltose intolerance is a familia defect associated with Indian childhood cirrhosis

1443 SELECTIVE PORTAL DECOMPRESSION. *(E.)* Britton, R. C. (Brooklyn-Cumberland Med Ctr., New York), A. B. Voorhees, Jr. and J. B. Price, Jr. *Surgery* 67(1):104-113, 1970.

Side-to-side splenorenal venous anastomosis with preservation of the spleen was performed in 17 patients (9 men and 8 women, 6 to 70 yr old) of whom one had schistosomiasis, 2 had extrahepatic portal obstruction without liver disease, 2 had Laennec's cirrhosis and 10 had posthepatic cirrhosis. All patients had bled from varices. Two patients died of hepatic and renal failure, resp. one month after operation; 3 patients died after leaving the hospital, 2 of hepatic failure and on of stroke. The 13 surviving patients have been followed from 10 months to 4 yr and none have had recurrent bleeding from varices. A mild encephalopathy developed in 2 patients on an unrestricte diet. Postoperatively, 3 patients developed ascites in association with congestive heart failur with pancreatitis and thrombosis of the portal an superior mesenteric veins, and with subacute hepatic failure, resp. Pre- and postoperative studie demonstrated lower final splenic vein pressures than those recorded at operation. An average reduction in absolute portal pressure in the splen circulation of 10.0 mm Hg with a range of 6.0 to 14.0 mm Hg resulted from operation. In the 6 patients studied before and after operation, total hepatic blood flow was reduced an average of 50% with a range of 10 to 69%.

1444 PRIMARY CARCINOMA AND CIRRHOSIS OF THE LIVER IN AUTOPSY MATERIAL. *(Pol.)* Starzyk, H. (Wroclaw, Poland), H. Sosnik, L. Oleszkiewicz and Z. Szydlowski. *Pol Tyg Lek* 24(4 1757-1759, 1969.

1445 CERVICAL ANASTOMOSIS BETWEEN LYMPH AND VENOUS CIRCULATION FOR REDUCTION OF PORTAL HYPERTENSION IN LIVER CIRRHOSIS. *(Ger.)* Thorban, W. (Dortmund, Germany). *Langenbeck Arch Chir* 325:542-545, 1969

6 FIRST EXPERIENCES WITH ARTERIALIZATION
OF THE LIVER AFTER PORTACAVAL ANASTOMOSIS.
r.) Matzander, U. (Hamburg, Germany). *Langen-*
k Arch Chir 325:1134-1139, 1969.

7 A RATIONAL APPROACH TO THE TREATMENT OF
ASCITES IN LAENNEC'S CIRRHOSIS. *(E.)*
seph, R. R. (Wayne County Gen. Hosp., Eloise,
chigan). *Med Clin N Amer* 53(6):1359-1365, 1969.

8 THE EFFECT OF ARTIFICIAL PORTOCAVAL
ANASTOMOSIS OR SPLENECTOMY ON HEPATIC
PORTAL HEMODYNAMICS IN CIRRHOTICS. *(E.)*
aha, V. (Postgrad. Med. Inst., Praha, Czech.)
J. Vosmik. *Nuclearmedizin* 8(3):232-241, 1969.

9 SPLENO-RENAL VENOUS ANASTOMOSES DURING
HEPATIC CIRRHOSIS. *(Fr.)* Batzenschlager,
(Civil Hosp., Strasbourg, Germany) and I. Kri-
isic. *Sem Hop Paris* 45(46):2891-2898, 1969.

0 BLOODY ASCITES: DIAGNOSTIC IMPLICATIONS.
(E.) Natelson, E. A. (Ben Taub Gen.
sp., Houston, Texas), T. W. Allen, S. Riggs and
L. Fred. *Amer J Gastroent* 52(6):523-527, 1969.

1 FOREARM METABOLISM IN PATIENTS WITH
CHRONIC LIVER DISEASE. *(E.)* Klassen,
A. (Roy. Victoria Hosp., England), A. Aronoff
G. Karpati. *Clin Sci* 37(2):455-470, 1969.

52 LAENNEC'S CIRRHOSIS. A CLINICAL STUDY
OF 100 CASES. *(Por.)* Torres, U. L.
isericordia Hosp. Santa Casa, San Paulo, Brazil),
C. Fonseca, C. L. Gonzalez and O. M. S. Doria.
Paul Med Chir 96(5):277-321, 1969.

- Diagproc (0936)
- D:Esoph (1005)(1006)
- D:Stomduo:Peptulc (1122)
- D:Livbil (1370)(1374)(1385)
- D:Livbil:V.Hep (1420)(1434)
- D:Livbil:C.Hep (1438)
- D:Gen:Parasit (1538)

1453 CHRONIC OBSTRUCTIVE JAUNDICE INDUCED BY REOVIRUS TYPE 3 IN WEANLING MICE. *(E.)*

Phillips, P. A. (Dept. Microbiol., Path., U. Western Australia), D. Keast, J. M. Papadimitriou, M. N-I. Walters and N. F. Stanley. *Pathology* 1(3):193-203, 1969.

Multiple i.p. injections of reovirus type 3 into weanling mice of the Prince Henry (PH) strain resulted in the development of jaundice in up to 5% of mice of the prototype PH_0 strain and up to 40% of mice of the PH_1 sub-strain. Electron and light microscope studies indicated that the jaundice was caused by obstruction of the common bile duct at the duodenal end following denudation of the bile-duct mucosa. Reovirus was seen replicating in bile-duct mucosal cells 6 to 8 days after the initial virus inoculation, and infectious reovirus 3 was recovered from bile ducts and other tissues during this period, but virus isolations were negative from bile ducts, livers and spleens when the jaundice became clinically apparent in the third week of the infection.

1454 MORTALITY FOLLOWING CHOLECYSTECTOMY. *(E.)*

Seltzer, M. H. (Hosp. U. Pennsylvania, Philadelphia), E. Steiger and F. E. Rosato. *Surg Gynec Obstet* 130(1):64-66, 1970.

A detailed analysis is presented of 17 deaths (1.6%, median age 67 yr) following 1090 consecutive cholecystecyomies. A primary diagnosis of gallbladder disease or common bile duct disease, or both, was made in 11 patients. Carcinoma was concomitantly observed in 6 patients, cardiovascular disease in 9 patients, diabetes mellitus in 1 patient and peptic ulcer in 1 patient. Radiographic examinations showed 7 patients with cholelithiasis, 3 with a dilated common bile duct and one with a cholecystoduodenal fistula (in 4 patients, the biliary system was not visualized). Elevated direct and total serum bilirubin was demonstrated in 8 patients. Cholecystectomy alone was performed in 6 patients, common duct exploration was performed in 7 patients, and other associated operative procedures were performed in 8 patients. The cause of death was pulmonary complications in 6 patients, myocardial infarctions in 2 patients, surgery-related causes in 4 patients and a variety of causes in the remaining 5 patients. A corrected mortality rate of 0.6% is suggested if only the deaths of patients without preoperative complications are considered.

1455 THE BABOON AND EXPERIMENTAL CHOLELITHIASIS. *(E.)*

Glenn, F. (New York Hosp.-Cornell U. Med. Ctr., New York) and C. K. McSherry. *Arch Surg* 100(1):105-108, 1970.

Biliary calculi were found in 2 of 7 female baboons incidental to experiments designed to study the effects of pregnancy (5 animals had previously been pregnant, 1 was pregnant at the time of the experiment and 1 most probably had never been pregnant) on the chemical composition of gallbladder and hepatic bile. One baboon had multiple calculi (roun dull and grey-green colored, 1 to 8 mm in diameter) in the gallbladder and cystic duct while in the other baboon, calculi were found only in the gallbladder. Chemical analysis of the calculi revealed a cholesterol content of 85 to 96% in the 2 baboons. Minimal chronic cholecystitis was found upon microscopic examination of the gallbladder, and liver biopsy was normal. The baboon may provide an experimental model for study of factors responsible for gallstone formation in humans.

1456 THE EFFECTS OF CHOLECYSTECTOMY ON ESOPHAGEAL SYMPTOMS. *(E.)*

Southam, J. A. (Epsom Distr. Hosp., Surrey, England). *Brit J Sur* 56(9):671-672, 1969.

The frequency of heartburn and regurgitation of a sour fluid into the mouth was studied before and after cholecystectomy in 53 patients (37 females and 16 males) with chronic gallbladder disease (heartburn and regurgitation occurred in 24 of th patients before surgery). When further studies were performed on 12 of the 24 patients, 11 patients showed positive perfusion tests using 0.1 HCl, 5 patients had positive perfusion tests with human bile, and 4 patients (with no esophageal symptoms) had negative perfusion tests. Six out 12 patients with esophageal symptoms had a hiatus hernia or radiological evidence of gastroesophage reflux and after cholecystectomy 7 of the 12 patients (3 with hiatus hernia) lost esophageal sym toms and all had negative acid perfusion tests. After 1 yr, 3 other patients reported minimal sym toms, and 2 had esophageal symptoms as severe as before surgery. Cholecystectomy alone seemingly relieves esophageal symptoms in most patients wit biliary disease even in the presence of a hiatus hernia.

1457 BILIARY MUCOUS SUBSTANCES IN DIHYDROCHOLESTREROL-INDUCED CHOLELITHIASIS.

(E.) Freston, J. W. (Dept. Med., U. Utah, Salt Lake City, Utah), I. A. D. Bouchier and J. Newman. *Gastroent* 57(6):670-678, 1969.

Biliary mucous substances in dihydrocholesterol-induced cholelithiasis were investigated in New Zealand rabbits by measuring the hexosamine conte in bile, gallbladders and gallstones before, afte and during gallstone formation and correlating th results with light and electron microscope studie of the gallbladder mucosa. Bile and gallbladder hexosamine concentrations were significantly higher in control animals than in those fed the lithogenic diet; but because mucous substances we left at the bile-gallstone interface after centri fugation and decantation, the reduced hexosamine concentration was probably inaccurate. Hexosamin concentration in combined gallstone and bile samples was measured after 4 to 14 days on the litho genic diet, and the mean hexosamine concentration was elevated by the 7th day and nearly doubled by

e 14th day. After the 7th day, gallbladder hexo-
amine content also rose but then remained rela-
ively constant. In a separate series (the cystic
ucts of dihydrocholesterol-fed animals were oc-
luded by gallstones), when dihydrocholesterol was
ed before cystic duct occlusion, hexosamine con-
entration and total hexosamine in the gallbladder
ac were substantially increased. The mean hexo-
amine concentration of gallstones was 17.34±10.15
/100g and there was a negative correlation be-
ween gallstone weight and hexosamine concentra-
ion. Light microscopy showed large vesicles,
ich stained for mucus, in or between the gall-
ladder epithelial cells of animals fed the litho-
enic diet but not in the controls, and electron
icroscopy showed subapical vesicles preceding the
rmation of gallstones in the dihydrocholesterol-
ed animals but not the controls. Increased se-
retion of mucous substances by the gallbladder
eemingly occurs before gallstone formation and
ring the period of gallstone growth.

58 MUCOSAL HYPERPLASIA OF THE GALLBLADDER IN CASES OF CHOLECYSTOLITHIASIS. *(E.)*
lfving, G. (Hyvinkas Distr. Hosp., Finland), E.
lvonen and H. Teir. *Acta Chir Scand* 135(6):
19-522, 1969.

rrelation between clinical symptoms (pain and in-
lerance to food) of cholecystolithiasis and mu-
osal hyperplasia of the gallbladder was studied
icroscopically in gallbladders from 104 postopera-
ive patients with cholecystolithiasis. Hyperplas-
ic changes (generally diffuse) in the mucosa oc-
rred in 23 of the 104 patients and were associated
ith the presence of single or multiple calculi in
choff-Rokitansky crypts (without signs of inflam-
ation). Mucosa was normal or destroyed by chronic
olecystitis and/or empyema in 81 patients and
ngle or multiple calculi occurred in 21 of these
atients. There was no difference in clinical
mptoms of cholecystolithiasis in patients with
rmal or hyperplastic mucosa. There is apparently
correlation between cholecystolithiasis and/or
ncurrent mucosal hyperplasia of the gallbladder.

459 PREGNANCY, CHOLESTEROL METABOLISM AND GALLSTONES. *(E.)* Glenn, F. (Cornell
ed. Coll., New York and C. K. McSherry. *Trans
outhern Surg Ass* 80:76-86, 1968.

he relation between gallstones, cholesterol me-
abolism and pregnancy was studied in 5 patients
n the second or third trimester of their first
regnancy and 41 patients (35 female and 6 male)
ith cholelithiasis. Of the females with chole-
ithiasis, 29 (21 to 78 yr old) had been pregnant
t least once. Serum bilirubin was normal in all
ut 1 of the parous women, in all the nulliparous
omen (32 to 59 yr old), in all the men (25 to 69
r old) and in the pregnant women (17 to 21 yr
ld). Two parous women showed mild elevations of
lkaline phosphatase, but normal values were found
n all the other groups. Total protein and albu-
in/globulin ratio was normal in all the patients.
Pregnant women tended to have higher values of serum cholesterol, but there was no statistically significant difference among the 4 groups. There was no significant difference in the cholesterol, phospholipid, triglyceride or total lipid content of gallbladder bile, nor in the 17-ketosteroid excretion in the 4 groups. Serum cortisol was elevated in gravid women and 17-hydrocorticosteroid excretion was increased in men and gravid women. Serum cortisol (mg/100 ml) was 30.4, 18.8, 20.4 and 17.4 in gravid women, parous women, nulliparous women and men, resp. Urinary 17-hydrocorticosteroid excretion (mg/24 hr) was 5.0, 7.6, 10.2 and 10.9 for parous women, nulliparous women, gravid women and men, resp. The nulliparous women and men may have had periods of hypercholesterolemia and/or cortisolemia associated with increased hormonal production, which could account for their gallstone production.

1460 STUDIES ON THE INTESTINAL ABSORPTION OF LABELED FAT-SOLUBLE VITAMINS (A, D, E AND K) VIA THE THORACIC-DUCT LYMPH IN THE ABSENCE OF BILE IN MAN. *(E.)* Forsgren, L. (Karolinska Inst., Stockholm, Sweden). *Acta Chir Scand* Suppl. 399:1-29, 1969.

The transport of labeled vitamins A, D, E and K in the thoracic duct lymph was studied in 6 patients with complete biliary obstruction due to pancreatic or common bile duct carcinoma and in 7 control subjects. Thoracic duct cannulation was done in all subjects and lymph was drained for at least one day and substituted quantitatively with blood, plasma and albumin. Radioactivity recovery varied in the controls and thoracic lymph appeared to be the normal medium for transport of absorbed fat-soluble vitamins. In patients with biliary obstruction, only small amounts of radioactivity were recovered from thoracic duct lymph, indicating a severe impairment of absorption of fat soluble vitamins in the absence of bile. Peak recovery of radioactivity was 2 to 6 hr in controls, following ingestion of the formula meal, and was less pronounced in patients with biliary obstruction.

1461 LIVER DAMAGE SUBSEQUENT TO CHOLEDOCHO-ENTEROSTOMIES. *(Ger.)* Zittel, R. X. (Freiburg, Germany). *Langenbeck Arch Chir* 325: 430-433, 1969.

1462 INDICATION FOR CHOLEDOCHODUODENOSTOMY IN THE TREATMENT OF THE POST-CHOLECYSTECTOMY SYNDROME. *(Ger.)* Mallet-Guy, P. (Lyon, France). *Langenbeck Arch Chir* 325:400-405, 1969.

1463 HEPATO-ENTEROSTOMY AND TRANSHEPATIC BY-PASS FOR BILE DUCT OBSTRUCTIONS. *(Ger.)* Dick, W. (Tubingen, Germany). *Langenbeck Arch Chir* 325:419-430, 1969.

1464 THE SOLUBILIZING EFFECT OF BILE SECRETED DURING CHOLESTYRAMINE MEDICATION ON HUMAN GALL STONES AND CONCRETIONS PREPARED FROM PURE CHOLESTEROL. *(Ger.)* Holub, K. (Vienna, Austria). *Langenbeck Arch Chir* 325:584-588, 1969.

1465 CAN THE NUMBER OF SECONDARY INTERVENTIONS IN THE EXTRAHEPATIC BILE DUCTS BE REDUCED? *(Ger.)* Ehlert, C. P. (Mainz, Germany). *Langenbeck Arch Chir* 325:588-590, 1969.

1466 PALLIATIVE MEASURES IN INOPERABLE MALIGNANT OBSTRUCTION OF THE BILE DUCT WITH PARTICULAR CONSIDERATION OF LONGMIRE'S DIRECT INTRAHEPATIC CHOLANGIOJEJUNOSTOMY. *(Ger.)* Schamaun, M. (Chur, Switzerland). *Langenbeck Arch Chir* 325:598-603, 1969.

1467 BILE PRODUCTION IN PATIENTS WITH BILE DUCT OBSTRUCTION. *(Ger.)* Stirnemann, H. (Berne, Switzerland), H. Bucher and R. Preisig. *Langenbeck Arch Chir* 325:1152-1159, 1969.

1468 PLASTIC SURGERY AND REPAIR OPERATIONS FOR INJURIES AND STRICTURES OF THE BILE DUCT. *(Ger.)* Schriefers, K. H. (Bonn, Germany). *Langenbeck Arch Chir* 325:406-419, 1969.

1469 FOUR CASES OF PRIMARY SCLEROTIC CHOLANGITIS. *(Ger.)* Sapkas, A. (Athens, Greece) and N. Karavas. *Langenbeck Arch Chir* 325:577-584, 1969.

1470 EXPERIENCE WITH DRAINAGELESS CHOLECYSTECTOMY. *(Ger.)* Kole, W. (no affil). *Langenbecks Arch Chir* 324(4):307 314, 1969.

1471 DIAGNOSTIC DIFFICULTIES BETWEEN CHOLECYSTITIS AND INFLAMMATORY INFILTRATE IN THE CAECUM. *(Pol.)* Kowal-Gierczak, B. (Wroclaw, Poland), M. Wrzyszcz, L. Oleszkiewicz and A. Giermanski. *Wiad Lek* 22(20):1885-1887, 1969.

1472 CARCINOMA OF THE GALLBLADDER. *(Sp.)* Gonzales, A. M. (no affil). *Galicia Clin* 41(11):869, 871, 873, 1969.

1473 GALLSTONES OF THE COMMON BILE DUCT IN A PATIENT WITH CONGENITAL ABSENCE OF GALLBLADDER. *(Pol.)* Gabrys, A. (no affil) and Z. Sachajdak. *Wiad Lek* 22(18):1717-1719, 1969.

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1476 CHOLEDOCHOLITHIASIS. *(Rus.)* Sitenko, V. M. (no affil.), A. I. Nechai, K. V. Novikov and V. P. Lantsov. *Klin Khir* (10):12-16, 196

1477 ON INTERNAL BILIARY FISTULAS. *(Rus.)* Dikhtenko, G. I. (no affil.), B. K. Malyi and Z. A. Lysak. *Klin Khir* (10):23-25, 1969.

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1479 ON SURGICAL TREATMENT OF CHOLELITHIASIS COMPLICATED BY OBSTRUCTIVE JAUNDICE. *(Rus.* Ogly, P. E. (no affil.), *Vestn Khir Grekov* 103(10 32-36, 1969.

1480 CHOLECYSTOKININ AND CHOLECYSTOGRAPHY: AN EDITORIAL. *(E.)* Matzner, M. J. (no affil). *Amer J Gastroent* 52(6):532, 1969.

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1482 SPONTANEOUS EXTERNAL BILIARY FISTULA. *(E.)* Fitchett, C. W. (Norfolk Gen. Hos Virginia). *Trans Southern Surg Ass* 80:214-220, 1968.

1483 CHOLEDOCHODUODENOSTOMY IN THE SURGERY OF COMPLICATED CHOLECYSTITIS. *(Rus.)* Bagnenko, E. M. (Region. Hosp., Kherson, USSR). *Klin Khir* (9):67-68, 1969.

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1485 CYSTIC DILATATION OF THE DUCTUS CHOLEDOCHUS. *(It.)* Morosini, S. (Dept. Surg., U. Parma, Italy). *Minerva Chir* 24(22):1317-1322, 1969.

1486 CONGENITAL DILATATION OF THE INTRAHEPATIC BILIARY TRACT ASSOCIATED WITH BILIARY FIBROADENOMATOSIS. *(It.)* Di Carlo, V. (Dept. Emerg. Gen. Surg., U. Milan, Italy), A. Martinotti and C. Bevilacqua. *Minerva Chir* 24(22):1323-1328, 1969.

1487 ATRESIA OF THE DISTAL PORTION OF THE DUCTUS CHOLEDOCHUS. CHOLEDOCHODUODENOSTOMY. URE. *(It.)* Guglielmi, M. (Surg. Clin., U. Pa- ua, Italy), G. Ricci and C. Sartorelli. *Acta ediat Lat* 22(3):332-339, 1969.

1488 BENIGN STENOSIS OF THE TERMINAL DUCTUS CHOLEDOCHUS. *(It.)* Bologna, A. (Surg. Clin., U. Turin, Italy), G. Del Poli, M. Dei Poli, G. C. Fossati and P. A. Rosso. *Minerva Chir* 24(22):1291-1311, 1969.

1489 MODERN ORIENTATION IN THE THERAPY OF CHOLELITHIASIS. *(It.)* Anonymous. *Clin Ter* 50(4):369-374, 1969.

1490 PREOPERATIVE EVALUATION OF BILLARY TRACT SURGERY IN OLD PATIENTS. *(Sp.)* Alazraky, I. (Nat. Hosp., Cordoba, Argentina) and J. A. Scopinaro. *Rev Argent Cirug* 16(4):396-397, 1969.

491 GALLBLADDER FUNCTION AFTER VAGOTOMY. *(E.)* Tinker, J. (Roy. Postgrad. Med. Sch., London, England) and A. G. Cox. *Brit J Surg* 56(10):779-782, 1969.

492 LIVER RESECTION FOR HEMOBILIA -- AN UNCOMMON CAUSE OF MASSIVE GASTROINTESTINAL HEMORRHAGE. *(E.)* Franco, P. E. (Dist. Columbia Gen. Hosp., Washington) and H. H. Balch. *Med Ann DC* 38(12):651-653, 1969.

493 PAPILLOMATOSIS OF THE GALLBLADDER IN METACHROMATIC LEUKODYSTROPHY. *(E.)* Kohn, . (Gov't. Hosp. "Assaf Harofe", Zrifin, Israel). *mer J Clin Path* 52(6):737-740, 1969.

494 SCARLET FEVER WITH HYDROPS OF THE GALLBLADDER. *(E.)* Strauss, R. G. (Child. Hosp. Res. Found., Cincinnati, Ohio). *Pediatrics* 44(5):741-745, 1969.

495 CARCINOMA OF THE EXTRAHEPATIC BILE DUCTS. REPORT OF NINE CASES. *(E.)* Eriksson, F. Karolinska Hosp., Stockholm, Sweden) and R. Pozo. *cta Chir Scand* 135(6):523-529, 1969.

496 POSTOPERATIVE CHOLERESIS FOLLOWING BILE DUCT OBSTRUCTION IN MAN. *(E.)* Preisig, . (Dept. Clin. Pharmacol. Surg., U. Berne, Swit- erland),H. Bucher, H. Stirnemann and J. Tauber. *ev Franc Etud Clin Biol* 14(2):151-158, 1969.

1497 CHOLECYSTITIS WITHOUT STONES. *(Ger.)* Elfving, G. (Helsinki, Finland). *Langenbeck Arch Chir* 325:572-576, 1969.

1498 THE TRANSDUODENAL APPROACH TO THE COMMON BILE-DUCT. *(E.)* Hardy, E. G. (Chester Roy. Infirm., England) and T. J. Davenport. *Brit J Surg* 56(9):667-671, 1969.

1499 CHOLEDOCHUS CYST: REPORT OF A CASE. *(E.)* Mitra, S. K. (B. S. Med. Coll. Hosp., Bankura, West Bengal, India) and B. Bhattacharyya. *Calcutta Med J* 66(8):235-239, 1969.

1500 UNUSUAL MANIFESTATIONS OF CARCINOMA OF THE GALLBLADDER. *(E.)* Tanga, M. R. (Ottawa Gen. Hosp., Canada) and J. B. Ewing. *Int Surg* 53(1):44-47, 1970.

1501 A CASE OF MELANOMA OF THE BILIARY DUCT. *(Fr.)* Gabriele, R. (Hosp. St. Barbe, Lyon, France) and C. Jouffre. *Lyon Chir* 65(5):682-685, 1969.

1502 THE PRECIPITATION BY HEPARIN OF ABNORMAL SERUM LIPOPROTIENS IN OBSTRUCTIVE JAUNDICE. *(Fr.)* Burstein, M. (Hosp. St. Antoine, Paris, France) and J. Caroli. *Rev Franc Etud Clin Biol* 14(2):182-184, 1969.

1503 A TECHNIQUE FOR T-TUBE DRAINAGE OF THE COMMON BILE DUCT. *(E.)* Enquist, I. F. (Methodist Hosp., Brooklyn, N. Y.). *Surg Gynec Obstet* 130(1):127, 1970.

- Diagproc (0937)(0951)(0952)(0957)(0965)(0976)
- D:Stomduo (1058)
- D:Pancreas:Pancreat (1340)
- D:Livbil (1371)
- D:Livbil:Nonv.Hep (1410)
- D:Gen:Parasit (1538)(1539)(1540)(1562)

1504 NODULAR HYPERPLASIA IN THE RAT LIVER FOLLOWING PROLONGED FEEDING OF PONCEAU MX. *(E.)* Grasso, P. (British Indust. Biol. Res. Ass., Surrey), A. B. G. Lansdown, I. S. Kiss, I. F. Gaunt and S. D. Gangolli. *Food Cosmet Toxic* 7(5):425-442, 1969.

The disodium salt of 1-(2, 4- or mixed xylylazo)-2-naphtol-3, 6-disulfonic acid (Ponceau MX), at levels of 0.125, 0.25, 0.5 and 1.0%, was fed to rats for 2 yr. At all dietary levels, death rate increased and body weight and food intake decreased although Ponceau MX was unpalatable only at the 1% level. Urinary excretion of ascorbic acid was increased at levels of 0.25% and above for 1 yr and anemia occurred at levels of 0.5 and 1.0%. Histopathological changes attributable to Ponceau MX (at all dietary levels) were found only in the liver and consisted of necrosis, small areas of enlarged hepatocytes, and nodules consisting either of areas of regeneration and fibrosis or of multilocular cysts. These changes are consistent with nodular hyperplasia following hepatocellular necrosis.

1505 PARATHORMONE-LIKE EFFECT OF MAGNESIUM REPLENISHMENT IN STEATORRHEA. *(E.)* Muldowney, F. P. (St. Vincent's Hosp., Dublin, Ireland), T. J. McKenna, L. H. Kyle, R. Freaney and M. Swan. *N Eng J Med* 281(2):61-67, 1970.

Tetany related to hypomagnesemia and hypocalcemia occurred in 5 of 9 patients with intestinal malabsorption and no demonstrable bone disease. Normal or low values for serum alkaline phosphatase and renal phosphate clearance suggested a possible failure of parathyroid response. Tetany was abolished in all 9 patients by intramuscular magnesium therapy. In two subjects with severe magnesium depletion, there was a coincident rise in serum calcium, phosphate clearance and alkaline phosphatase. Infusion of parathyroid extract in the magnesium-depleted state resulted in increased phosphaturia without a rise in serum calcium. Following Mg repletion, both phosphaturic and calcemic effects are seen. The results are consistent either with a failure of parathormone secretion during Mg depletion, or with a reversible resistance of bone to parathormone action.

1506 A DOUBLE-BLIND CROSS-OVER CLINICAL EVALUATION OF METOCLOPRAMIDE AND A COMBINATION OF HALOPERIDOL AND ISOPROPAMIDE IODIDE IN GASTROENTEROLOGY. *(E.)* De Vries, P. M. (Dept. Gastroent., U. Leiden, The Netherlands). *Arzneimittelforschung* 19(10):1766-1767, 1969.

Metoclopramide, Vesalium (haloperidol plus isopropamide iodide) and placebo were compared in treatment of functional gastrointestinal disorders (when administered in low non-psychiatric dosages), under rigorous double-blind conditions. Out-patients (14, 18 to 63 yr old) who had long-standing, severe, and relatively constant gastrointestinal complaints were selected for the study. Improvement was significantly greater with metoclopramide and with Vesalium than with placebo treatment. In the dosages used, the therapeutic efficacy of Vesalium (0.3 mg haloperidol + 2 mg isopropamide iodide, t.i.d.) and metoclopramide (10 mg t.i.d.) was comparable.

1507 UNUSUAL CLINICAL MANIFESTATIONS AND ANGIOGRAPHIC FINDINGS IN A PATIENT WITH THE ZOLLINGER-ELLISON SYNDROME. *(E.)* Levitan, R. (820 S. Damen Ave., Chicago, Ill.), M. Moritz and A. D. Callow. *Ann Intern Med* 71(6):1133-1140, 196

A 36-yr-old woman with Zollinger-Ellison syndrome is presented in whom diarrhea and steatorrhea were the major clinical findings. The diarrhea rapidly disappeared when she was placed on a gluten-free diet. Selective celiac angiographic studies revealed a normal aortogram, an enlarged dorsal pancreatic artery with 2 irregular branches going to the head of the pancreas outlining a slightly vascular tumor mass, several prominent vessels to the tail of the pancreas and a large gastric branch. Injection of 15 μg of epinephrine did not produce the normal constriction of the gastric arteries, resulting in an intense blush in the portion of th stomach supplied by the splenic arteries. There was diminished vascularity in the right lobe of th liver. The gastroduodenal artery was considerably enlarged with prominent pancreaticoduodenal and right gastroepiploic arteries. These angiographic findings indicated a pancreatic tumor with liver metastases. A total gastrectomy with esophagojejunostomy, jejunojejunostomy and cholecystojejunostomy was performed. Following an uneventful recovery the patient was discharged but was readmitted 6 months later due to a deteriorating conditio The appearance of an increased skin pigmentation was associated with an elevated serum level of β-melanocyte-stimulating hormone. After 3 days th patient died. An analysis of the pancreatic tumor extract showed no β-melanocyte-stimulating hormone or ACTH activity.

1508 HOUSING AND CERTAIN SOCIOENVIRONMENTAL FACTORS AND PREVALENCE OF ENTEROPATHOGENIC BACTERIA AMONG INFANTS WITH DIARRHEAL DISEASE IN PANAMA. *(E.)* Kourany, M. (Georgas Mem. Lab., Balboa Hts., Canal Zone) and M. A. Vasquez. *Amer J Trop Med Hyg* 18(6):936-941, 1969.

A survey was conducted in Panama of the dwellings of 1819 infants with diarrheal disease who had been examined for the presence of enterobacterial pathogens. The dwellings (in or near Panama City) were classified as 6 types of which 5 types were substandard and their occupants were of low socioeconomic class and the remaining type was single-family houses or apartments with middle to upper class occupants. *E. coli*, *Shigella* and *Salmonella* (alone or in association with one another) were more prevalent in infants living in substandard dwellings than from the better class houses, with the 2 most frequently encountered pathogens being E. *coli* 055:B5 and 0128:B12. The difference in prevalence of enterobacterial pathogens among the 5 substandard housing types (6.0 to 10.2%) was not significant, but contrasted markedly to the zero infection rate noted in the better type housing.

1509 INTESTINAL OCCLUSION: ANALYSIS OF 100 TREATED CASES. *(Por.)* Neto, C. A. H. (Hosp. Our Lady of Grace, Curitiba, Brazil), Z. A. Z. A. deS. Filho, C. E. Pozzobon, E. Abrao and G. V. Artigas. *Hospital* 76(3):1085-1093, 1969.

1510 MORPHOLOGICAL CHANGES IN THE INTESTINE IN PSEUDOMEMBRANOUS ENTEROCOLITIS. *(Rus.)* Ryzkov, E. V. (no affil) and V. N. Krasnogolovets. *Klin Med (Moskva)* 47(10):76-80, 1969.

1511 A NEW TRANQUILIZER IN GASTROENTEROLOGY. *(Sp.)* Nevado-Rincon, H. (Central Hosp., Maracaibo, Venezuela), M. B. Ramirez and H. S. Marquez. *GEN* 24(1):79-83, 1969.

1512 SECRETORY RESPONSE TO SECRETIN IN A PATIENT WITH DIARRHEA AND THE ZOLLINGER-ELLISON PATTERN OF GASTRIC SECRETION. *(E.)* Petersen, H. (Ulleval Hosp., Oslo, Norway), J. Myren and I. Liavag. *Gut* 10(10):796-799, 1969.

1513 EMBRYONIC ABDOMINAL MUSCULATURE ASSOCIATED WITH ANOMALIES OF THE GENITOURINARY AND GASTROINTESTINAL SYSTEMS. *(E.)* O'Kell, R. T. (St. Luke's Hosp., Kansas City, Mo.). *Amer J Obstet Gynec* 105(8):1283-1284, 1969.

1514 MEDICAL EMERGENCIES IN GASTROENTEROLOGY. *(Fr.)* Naudin, G. (Hosp. Paris, France). *Concours Med* supp to 45:1-52, 1969.

1515 THE ROENTGEN DIAGNOSIS OF RETRACTILE MESENTERITIS. *(E.)* Clemett, A. R. (St. Vincent's Hosp., New York, N. Y.) and D. G. Tracht. *Amer J Roentgen* 107(4):787-790, 1969.

1516 TRASYLOL AND PERITONITIS. *(Ger.)* Nagel, M. (Mainz, Germany). *Langenbeck Arch Chir* 325:327-333, 1969.

1517 BATTERED CHILDREN WITH ABDOMINAL TRAUMA. *(E.)* Touloukian, R. J. (Yale U. Sch. Med., New Haven, Conn.) *G P* 40(6):106-109, 1969.

1518 ANOREXIA NERVOSA. *(Fin.)* Taipale, V. (no affil). *Duodecim* 85(21):1331-1341, 1969.

1519 THE SENSITIVITY AND RESISTANCE OF DIFFERENT *E. COLI* SEROTYPES ASSOCIATED WITH INFANTILE DIARRHEA TO VARIOUS ANTIBIOTICS AND CHEMOTHERAPEUTIC AGENTS. *(E.)* Refai, M. (no affil) and I. M. Sadek. *J Egypt Public Health Ass* 197-208, 1969.

1520 THE ZOLLINGER-ELLISON SYNDROME: WITH REPORT OF ILLUSTRATIVE CASE. *(E.)* Kluck, J. J. (U. Mississippi Sch. Med., Jackson) and J. D. Hardy. *J Mississippi Med Ass* 10(12):535-541, 1969.

1521 KWASHIORKOR WITH PSYCHOLOGIC ETIOLOGY. A CASE SECONDARY TO DIETARY IMBALANCE IN AN INFANT OF MIDDLE-CLASS, EDUCATED PARENTS IN THE UNITED STATES. *(E.)* Shappley, B. G. (U. Virginia Med. Ctr., Charlottesville, Va.), T. E. Williams, McL. Birdsong and M. H. Donaldson. *Clin Pediat* 8(12):709-711, 1969.

1522 OCCULT BLOOD IN FECES. *(E.)* Case, R. A. M. (Chester Beatty Res. Inst., London, England). *Lancet* II(7631):1198, 1969.

1523 A STUDY OF DIURETIC ACTION OF ETHACRYNIC ACID. *(E.)* Somani, P. N. (Coll. Med. Sci., Banaras Hindu U., Varanasi, India), S. G. Jhingran, A. M. Chaterjee, R. K. Seth and B. C. Katiyar. *J Indian Med Ass* 53(6):282-286, 1969.

1524 THE ZOLLINGER-ELLISON SYNDROME IN A CHILD. *(E.)* Burmester, H. B. C. (Bradford[A] Group Hosps., England), R. Hall and N. Munawer. *Gut* 10(10):800-803, 1969.

- P:Secr:Int (0918)
- Diagproc (0933)(0942)(0961)
- D:Stomduo (1088)(1089)(1090)
- D:Stomduo:Peptulc (1137)
- D:S.Intest (1173)(1203)
- D:L.Intest (1234)
- D:Livbil (1360)(1391)
- D:Livbil:Cirrh (1440)
- D:Gen:Parasit (1544)

1525 ENTEROPATHOGENIC BACTERIA ASSOCIATED WITH DIARRHEA AMONG INFANTS IN PANAMA. *(E.)*

Kourany, M. (Gorgas Mem. Lab., Balboa Hts., Canal Zone) and M. A. Vasquez. *Amer J Trop Med Hyg* 18(6):930-935, 1969.

The presence of enteropathogenic bacteria was studied in 1819 infants with diarrhea. 7.9% of the rectal-swab cultures from these patients revealed pathogens, with *Escherichia (E.) coli* accounting for 5.3%, *Shigella* for 1.7% and *Salmonella* for 1.2%. Enteropathogenic *E. coli* and *Salmonella* were isolated from infants with diarrhea only and *Shigellosis* from infants whose diarrhea was accompanied by other symptoms. The highest rate of infection (12%) was found in dehydrated infants.

1526 NITRO-IMIDAZOLE IN PROTOZOAL INFECTIONS (AMEBIASIS, GIARDIASIS AND TRICHOMONIASIS. *(E.)*

Abd-Rabbo, H. (Fac. Med. Alexandria, Egypt), M. Montasir, H. Abaza and Y. El-Gohary. *J Trop Med Hyg* 72(11):271-276, 1969.

A new oral nitro-imidazole derivative (BT985) was studied in 19 patients with various protozoal diseases (amebiasis grardiasis and trichomoniasis). Different dosing schedules of the compound were administered to 8 patients with acute amebiasis (acute amebic colitis, and acute hepatic amebiasis, lung abscess) and in all cases there was a 100% parasitological cure with all signs and symptoms of disease gone by 3 months. Relapse rate with cyst reappearance amounted to 40% after a 3-month follow up in 5 patients treated for chronic amebic colitis (cyst passers). Two of 3 patients were cured of *G. lamblia* infection after 250 mg of drug was given for 10 days. Recovery occurred within a week and was maintained for the 3 month follow up. In 2 patients with Trichomonas urethritis, clinical cure occurred within 2 to 4 days following 250 mg t.i.d. No serious side-effects were observed with only transient headache and skin rash noted in 1 patient. Renal and hepatic function were not affected by nitro-imidazole medication.

1527 AMEBIASIS IN AN EXPERIMENTAL MODEL -- SOME OBSERVATIONS. *(E.)*

Saha, T. K. (Sch. Trop. Med., Calcutta, India). *Indian J Path Bact* 12(2):96-100, 1969.

The course and pathology of amebiasis was studied in guinea pigs in which cecostomy tubes were used to experimentally innoculate the animals with *E. histolytica* infection. Animals showed excessive mucous exudates and rapid tissue invation resulting in extensive tissue necrosis and lysis. In animals with prolonged infections, there were no liver changes. This method of using model guinea pigs in experimental production of *E. histolytica* may eliminate innoculation following surgery and dietetic and/or other regimentation to stimulate ameba growth and this technique offers an opportunity to study the parasite, the course of infection, the tissue changes and the effects of various modifying factors including diet and drugs.

1528 THE ARIZONA GROUP OF ORGANISMS IN THE AETIOLOGY OF CHILDHOOD DIARRHEA. *(E.)*

Bhat, P. (Christian Med. Coll. Hosp., Vellore, S. India), S. Shanthakumari and R. M. Meyers. *Indian J Med Res* 57(7):1240-1245, 1969.

Diarrheal and non-diarrheal stool specimens from Indian children, up to the age of 5 yr, were examined for Arizona organisms. Several plating media were used, including lysine-iron agar which is of particular value for the detection of the Arizona group. If the lysine-iron agar reaction was typical of the Arizona strains, further biochemical studies were employed to exclude some Salmonella strains. In 1 study, examination of rectal swabs from 3,131 diarrheal episodes (representing rural, semi-urban, ward and out patients) revealed an Arizona isolate from only 1 in-patient (a 7 month old infant). In a separate longitudina study, no Arizona organisms were recovered from an of 1,944 non-diarrheal or 472 diarrheal specimens. The results indicate that the Arizona organisms play a very small role in the etiology of diarrhea disease in the young children of Vellore, S. India a finding which corresponds with studies carried out in Israel.

1529 *SHIGELLA* INFECTION IN BREAST-FED GUATEMALAN INDIAN NEONATES. *(E.)*

Mata, L. J. (Inst. Nutr. Central America and Panama, Guatemala), J. J. Urrutia, B. Garcia, R. Fernandez *Amer J Dis Child* 117(2):142-146, 1969.

During a 4 yr period 109 of the 210 Indian childre (breast-fed) born in a Guatemalan village (under inadequate sanitary conditions) were followed by serial fecal cultures, physical examinations and studies of dietary intake for at least the first month of life. Infection by *Shigella* occurred in 4 (3.6%) of the children within the first 28 days of life. In 1 child (exclusively breast-fed), the infection was transient and asymptomatic and fecal culture was positive for *S. sonnei* on the 28th day of life, but negative during the following 12 weeks. In 2 other children (who received food sup plements), the infection (*S. flexneri*) was asymptomatic but occurred repeatedly from the third to 14th week in 1 case and from the fourth to 22nd week in the other. The fourth child (who received inadequate nursing and insufficient food supplements) developed severe diarrhea and fecal culture positive for *S. flexneri* by the 12th day of life. All infants recovered without administration of antimicrobials. Differences in intestinal microflora of breat-fed and artifically fed neonates, o other factors such as antibodies of antimicrobials in breast milk, may have been responsible for the varied pattern of *Shigella* infection.

1530 TREATMENT OF SCHISTOSOMIASIS BY DIATHERMY. *(E.)*

Asfoury, Z. M. (Sch. Hosp. Zein Al-Abdin, Cairo, Egypt). *J Trop Med Hyg* 72(10):231-240, 1969.

Short wave and long wave diathermy techniques wer used in treatment of 105 school children with schistosomiasis and an equal number of patients were treated by the slow tarter emetic method. Patients were considered to be negative when the excrete contained no schistosome eggs or only a few dead ones. In 95 cases treated with short wave diathermy, 73 patients (78%) were negative for 6 months, and of these, 52 (54%) remained negative for the next six months. With long wave therapy, 6 out of 10 patients (60%) were negative for 6 months, but only 3 (30%) continued to remain negative. The control patients treated with slow tarter emetic had a cure rate of 68% after 6 months and 43% for the following 6 months. No adverse effects were reported from either group receiving diathermy therapy.

1531 CLINICAL EVALUATION OF A NEW ANTHELMINTIC; PHENYLENE DI-ISO THIOCYANATE (BITOSCANATE) IN HOOKWORM AND ROUNDWORM INFESTATION. *(E.)* Gaitonde, B. B. (Grant Med. Coll., Bombay, India), H. H. Kulkarni, R. A. Kamat and B. J. Vakil. *J Trop Med Hyg* 72(10):253-258, 1969.

Phenylene di-iso thiocyanate (Bitoscanate) was administered to 33 patients infected with hookworm (in a single daily dose of 150 mg) and was given to 29 patients with roundworm (at either a dose of 150 mg or with three 100 mg does given at 12-hr intervals). The efficacy of the drug was assessed on the basis of percentage reduction of egg load in stool samples at the end of the 16th day of therapy and hematology, urine analysis and liver function tests were done in all hookworm patients before and at the 16th day of therapy. Bitoscanate was ineffective in the treatment of roundworm infection with either the single dose or triple dose regimen. Twenty patients with hookworm (63%) showed a 70% or more reduction in egg load after a single 150 mg dose of Bitoscanate. The overall incidence of toxicity (vomiting and dizziness) was 35% with single dose therapy and 56% with triple dose regimen. No abnormality in biochemical test results were noted, and the deworming effect was not seen consistently.

1532 EVALUATION OF INDIRECT HEMAGGLUTINATION TEST IN THE DIAGNOSIS OF AMEBIASIS. *(E.)* Rao, V. G. (Osmania Med. Coll., Hyderabad, A.P., India) and M. C. Padma. *Indian J Path Bact* 12(2): 74-83, 1969.

1533 INTESTINAL OBSTRUCTION IN MURINE SCHISTOSOMIASIS JAPONICA. *(E.)* Warren, K. S. (U. Hosps., Cleveland, Ohio). *Gastroent* 57(6): 697-702, 1969.

1534 SURGICAL TREATMENT OF SCHISTOSOMIASIS BY EXTRACORPOREAL HEMOFILTRATION IN BABOONS AND IN MAN: *S. MANSONI* AND *S. HEMATOBIUM*. *(E.)* Goldsmith, E. I. (New York Hosp. - Cornell Med. Ctr., N.Y.) and B. H. Kean. *Ann NY Acad Sci* 162(1):453-458, 1969.

1535 ECHINOCOCCOSIS UNILOCULARIS HEPATITIS WITH CYST RUPTURE INTO THE BILIARY DUCTS. REPORT OF A CASE. *(E.)* Nyqvist, A. (Ekmanska Hosp., Goteborg, Sweden) and H. Tillander. *Acta Chir Scand* 135(6):549-551, 1969.

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1537 EXPERIENCE OF CLINICAL USE OF TRANSHEPATIC CHOLANGIOGRAPHY. *(Rus.)* Shalimov, A. A. (Kharkov, USSR), G. A. Klimenko, A. M. Levendiuk and F. P. Vorobyev. *Klin Khir* (10):17-23, 1969.

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Cancer, Polyps, Radiological Detection (0188)*

RECTUM

Cancer, Polyps, Precancerous (0188)*

CANCER

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DIAGNOSIS

Radiology, Cancer, Large Intestine (0188)*

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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabolic Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology have accompanying abstracts.

The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great diversity of publications in the area of gastroenterology makes it imperative that an appropriate service be available to investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim is to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comments for consideration whenever possible.

GASTROENTEROLOGY ABSTRACTS and CITATIONS is published monthly and includes citations and abstracts from the biomedical world literature as they are currently received. In addition, yearly cumulated subject and author indexes are published.

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. For journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC,µC	milli-,microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10^{-9})
CNS	central nervous system	pg	picogram (10^{-12})
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
µg	microgram(s)	resp.	respectively
hr	hour(s)	Rev.	review (only in citations)
i.m.	intramuscular	RNA	ribonucleic acid
i.p.	intraperitoneal	s.c.	subcutaneous
IU	international unit(s)	sec	second(s)
i.v.	intravenous	SGOT	serum glutamic-oxalacetic transaminase
kg	kilogram(s)	SGPT	serum glutamic-pyruvic transaminase
LD_{50}	median lethal dose(s)	U	unit(s)
LDH	lactic acid dehydrogenase	UV	ultraviolet
m	meter(s)	WBC	white blood cells (leukocytes), white blood count
M	molar	yr	year(s)
mEq	milliequivalent(s)		
mM	millimolar		
µM	micromolar		

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

1562 EXPLANT CULTURE OF RAT LIVER: I. METHOD, MORPHOLOGY, AND CYTOGENESIS. *(E.)* Alexander, R. W. (U. Texas Sch. Med., San Antonio) and J. W. Grisham. *Lab Invest* 22(1):50-62, 1970.

The *in vivo* origin and morphology of cell outgrowths from 1- to 5-day-old rat liver explants cultured (in a gas-tight chamber) for 5 to 8 days *in vitro* were studied by time-lapse cinephotomicrography, histochemistry, autoradiography and electron microscopy. Three types of epithelial cells were most prominent in the outgrowths. The first (and most prominent) was structurally identical to *in vivo* hepatocytes and contained glycogen, glucose-6-phosphatase, adenosine triphosphatase and acid phosphatase; the second resembled mesothelium or endothelium and was characterized by a single-layered, attached sheet subtended by a basement membrane; and the third resembled tubules morphologically identical to *in vivo* bile ductules. There were several types of mesenchymal cells in the outgrowths and these included macrophages (derived from Kupffer cells) which phagocytosed carbon, fibroblasts which synthesized collagen fibers, polymorphonuclear neutrophils, and other hematopoietic cells.

1563 ISOLATION OF PURIFIED NUCLEAR AND CHROMATIN FRACTIONS FROM CHICK INTESTINAL MUCOSA. *(E.)* Haussler, M. R. (Sch. Med., U. Pennsylvania, Philadelphia), W. W. Thomson and A. W. Norman. *Exp Cell Res* 58(2-3):234-242, 1969.

Techniques are described for the isolation of 75-80% of the cellular DNA as purified nuclei or nuclear chromatin in high yield from chick intestinal mucosa. Isolation of the nuclei involved treatment of the crude nuclear fraction with 0.1% Triton X-100 followed by sedimentation through 1.75 M sucrose at pH 7.5 containing 0.025 M KCl, 0.05 M Tris, and 0.005 M magnesium chloride. Chromatin was prepared from nuclei by gentle breaking of the nuclear membrane with hypotonic EDTA and homogenization and was purified by centrifugation in 1.75 M sucrose. Both techniques permitted the isolation of other cytoplasmic components such as mitochondrial and microsomal fractions. Electron micrographic examination of the nuclei and chromatin indicated that they comprise relatively homogenous and morphologically intact structures. Chemical analysis of crude nuclei, purified nuclei and chromatin revealed an mg ratio of RNA:DNA of 0.80:1.0; 0.30:1.00, and 0.12:1.0, respectively. When assayed for template efficiency in the synthesis of RNA, the chromatin was shown to be biologically active. The techniques described may be highly useful in studies of interaction of vitamin D and its metabolites in the intestine.

1564 THE ELECTRON MICROSCOPY OF LIVERS OF MICE RUNTED AS A RESULT OF THE GRAFT *VERSUS* HOST REACTION AND BACTERIAL ENDOTOXIN. *(E.)* Papadimitriou, J. M. (Dept. Path. Microbiol., U. Western Australia, Perth) and D. Keast. *Brit J Exp Path* 50(6):574-577, 1969.

The livers of mice runted as a result of the graft versus host reaction or bacterial endotoxemia were examined with electron microscopy. Livers from mice with both types of runting showed polymorphonuclear neutrophils and platelet aggregation and osmophilic material in the sinusoids. Kupffer cells lining the sinusoidal walls were hypertrophied and had increased lysosomes and phagosomes and a well formed Golgi complex. Hepatocytes were generally atrophic and had swollen mitochondria, which were reduced in number and contained few cristae. Dilated bile canaliculi with few microvilli were also seen in the livers of mice with both types of runting. The similarity of the lesions suggests that endotoxemia is responsible for at least some of the cellular damage in the livers of the graft versus host reaction runts and the reaction may be a secondary feature which develops as a result of an impaired immune system.

1565 PREPARATION OF ISOLATED RAT LIVER MITOCHONDRIA FOR ELECTRON MICROSCOPY. *(E.)* Butler, W. H. (U. Coll. Hosp. Med. Sch., London, England) and J. D. Judah. *J Cell Biol* 44(2):278-289, 1970.

The effects of fixation with osmium tetroxide, glutaraldehyde and potassium permanganate on the electron microscopy of isolated rat liver mitochondria were studied. The configuration of the mitochondria varied with the nature of fixation procedure (either mitochondrial pellet or suspension) and the molarity of the solution in which the mitochondria were prepared. Mitochondria were round and the cristae were irregularly dilated when prepared in 0.25 M sucrose, and were elongated when prepared in 0.44 M sucrose. Fixation of mitochondria in pellet form produced greater disruption of the mitochondrial structures than fixation in suspension. Fixation of mitochondria in veronal-buffered 2% potassium permanganate resulted in preservation of mitochondrial structure (resembling that seen in situ). There were some breaks in the membranes but the cristae were regular and there was little increase in the space between the inner and outer membranes. Fixation with buffered (veronal, phosphate, chromate or cacodylate) produced inconsistent effects on the mitochondrial matrices and membranes.

1566 SURFACE STRUCTURE OF INTESTINAL EPITHELIUM. *(E.)* Balcerzak, S. P. (Dept. Med., Ohio St. U., Columbus), W. C. Lane and J. W. Bullard. *Gastroent* 58(1):49-55, 1970.

The surface structure of the mucosa of normal human and rat small intestine was studied by scanning electron microscopy. Human specimens were studied as intact tissue while rat intestinal epithelium was studied after partial or complete separation from the underlying villus core. At low magnifications, both human and rat intestinal epithelial cells occurred in groups with a variable number of openings (presumably goblet cell orifices) and separated by indentations or crevices. At high manifications, the details of the surface of rat and human small intestine are relatively obscured by a homogeneous layer (probably mucus or an enteric coat), however, at certain portions of the luminal surface, the cobblestone appearance of the tips the microvilli are visualized. Removal of this homogeneous layer (with HCl) allows visualization of the individual polygonal outline of individual epithelial cells and the cobblestone appearance of the microvilli tips become more prominent. Dissociation of the intestinal epithelium from the villus core provides a profile view of the surface contours of the epithelium as well as the villus core. In these specimens, the brush border appears as fluted edge projecting from the tops of epithelial cells and the lateral margins of epithelial cells show variable projections (remants of intercellular bridges). The lateral surface of isolated intestinal epithelial cells is rough and irregular, but has fewer projections than cells just beginning to strip off from the villus. This morphological description of normal human and rat intestinal epithelium by scanning electron microscopy complements that by light and transmission electron microscopy.

1567 RENEWAL OF PANETH CELLS IN THE SMALL INTESTINE OF THE MOUSE. *(E.)* Cheng, H. (Dept. Anat. McGill U., Montreal, Canada), J. Merzel and C. P. Leblond. *Amer J Anat* 126(4):507-526, 1969.

The origin and fate of Paneth cells in the duodenum, jejunum and ileum were studied by radioautography after administration of ^{3}H-thymidine either as a single injection, in drinking water for 4 days, or as a continuous infusion for up to 10 days in adult female mice. No mitosis was observed in Paneth cells. Labeling of Paneth cells occurred 1-2 days after single injection or prolonged administration of ^{3}H-thymidine and the labeled cells were characterized initially by tiny granules and later (with aging) by larger granules. Eventually, the Paneth cells died by degeneration. The turnover time (renewal) of the Paneth cell population in the duodenum, jejunum and ileum was 18-22 days. Undifferentiated cells (intercalated columnar cells) were adjacent to the Paneth cells and were characterized by frequent mitoses and early ^{3}H-thymidine labeling. These cells may be precursors of Paneth cells.

1568 A STUDY OF THE SMALL INTESTINAL MUCOSA USING THE SCANNING ELECTRON MICROSCOPE. *(E.)* Marsh, M. N. (Roy. Postgrad. Sch. Med., London, England) and J. A. Swift. *Gut* 10(11):940-949, 1969.

Jejunal mucosal specimens, obtained from normal human subjects, were fixed in 5% glutaraldehyde, freeze-dried, coated with carbon and silver and examined with a Stereoscan mk II scanning electron microscope. At low magnification, all parts of the jejunal mucosa were in sharp focus and, with magnification of x100 to x5,000, there was individual resolution of villi which varied in shape (leafed villi were noted in most mucosae). The numerous crypt orifices greatly exceeded the villi with which they were related, opened abruptly onto the surface, and contained amorphous material. The villi had a corrugated surface with the majority of the deep, irregular clefts running in a horizontal direction and the corrugations ended abruptly and did not form a continuous system of clefts. Occasionally goblet cell orifices (of varying outine and size) opened into the clefts. Many goblet cells were empty, but the orifices were fenestrated by membranes adherent to the interior surface of the underlying goblet; at other times mucus extruded from the cells. Flat-topped or gently convex, hexagonally packed epithelial cells with a mean diameter of 7.2 to 7.9 microns were noted. At magnifications between x5,000 and x10,000 microvilli (appearing as discrete structures) gave the surface a granular or feathery texture. At magnifications of x20,000 microvilli (seen as rod-shaped structures with a diameter of 0.1 to 0.2 microns) were separated by spaces of 0.01 to 0.02 microns.

1569 FACTORS INFLUENCING VILLUS SIZE IN THE SMALL INTESTINE OF ADULT RATS AS REVEALED BY TRANSPOSITION OF INTESTINAL SEGMENTS. *(E.)* Altmann, G. G. (Dept. Anat., McGill U., Montreal, Canada) and C. P. Leblond. *Amer J Anat* 127(1):15-36, 1970.

An index of villus size was obtained by counting the number of epithelial cells per representative villus section in longitudinal sections (several operative procedures were performed to alter the intestinal environment) of the small intestine of 3- to 4-month-old male Sherman rats, weighing 300 to 400 grams. In the unoperated controls, the villus size decreased gradually along the length of the small intestine, with villi size being three times as large in the upper duodenum as in the lower ileum. In ileal segments inserted into the jejunum, villi enlarged to the size of local jejunal villi and in jejunal segments inserted into the ileum, the villi decreased to the size of local ileal villi. In duodenal segments inserted into the ileum, the villi did not decrease in size and distally located ileal villi enlarged. In segments of intestine made into blind sacs by closing their blind end and joining their distal end to the colon, the influence of chyme was removed. Villus size decreased in sacs of jejunum and of lower duodenum, but increased in sacs of the ileum. There was a tendency for the villi in these three types of sacs to acquire an intermediate size in a chyme-free, nonfunctioal intestinal environment. Villus-enlarging factors appear to be present in pyloric and duodenal sections, and villus-reducing factors in the ileal chyme.

1570 PROGRESSIVE CHANGES IN THE SMALL-INTESTINAL VILLOUS PATTERN WITH INCREASING LENGTH OF GESTATION. *(E.)* Ferguson, A. (U. Glasgow Dept. Med., Scotland), J. D. Maxwell and K. E. Carr. *J Path* 99(1):87-91, 1969.

At routine necropsies in Glasgow, the small intestine of 40 infants (11 stillborn and 29 aged 10 min to 4 days) was sampled at the duodenum (2nd part), jejunum, and proximal and distal ileum. All the babies were of British-Caucasian parentage. In 29 of 36 duodenal specimens, the small intestinal villous pattern was of broad-leaf villi or short ridges, with the long axes of the villi running transversely round the gut. The jejunal villous pattern was not orrelated with length of life. There was some corelation with the cause of death (finger villi and inger villi mixed with tongue villi were found in ost babies dying as a result of prematurity or the espiratory distress syndrome). There was a clear elation between the villous pattern and the length f gestation. Up to 26 weeks after conception, ainly finger villi were present; from 26 to 34 eeks after conception there was a mixture of finger nd tongue villi; at term the pattern was of mixed inger, tongue and leaf villi. The proximal and distal ileal patterns were very similar to those for jejunum, with the same relation to the length of gestation.

571 A NEW METHOD FOR MEASURING INTESTINAL CELL TRANSIT TIME. *(E.)*

Sigdestad, C. P. (Allegheny Gen. Hosp., Pittsburgh, Penna.), R. F. Hagemann and S. Lesher. *Gastroenterology* 58(1): 47-48, 1970.

Liquid scintillation-counting techniques were used to measure the time interval for intestinal epithelial cell migration from the proliferative zone of the crypts to the extrusion zone of the villi of adult male Ha/ICR mice. A 2μC dose of tritiated thymidine (^{3}HTdR) was injected i.p. every 5 hr for 65 hr and samples of duodenum, jejunum, and ileum were taken 30 min after each injection for radioassay. Disintegrations per min per mg plotted versus time showed a linear increase as the cells incorporated the ^{3}HTdR and moved up the villi, followed by a plateau representing a steady state between cell proliferation and extrusion. The intersect of the regression lines for these two components of the curve represents the cell transit time. Comparison of values obtained by this method with those obtained autoradiographically showed generally good agreement (there was an appreciable difference only in the values for the ileum, which may reflect the difficulty in determining the extrusion zone of villus sections because of their clubbed shape.) This new method is easier to use than the former microscopic methods, and gives results based on a greater number of crypts and villi, and is especially applicable for transit time measurements in animals in which the crypt-villus morphology is not readily discernible.

1572 MICROSCOPY OF THE LIVING PANCREAS *IN SITU*. *(E.)*

McCuskey, R. S. (Coll. Med. U. Cincinnati, Ohio) and T. M. Chapman. *Amer J Anat* 126(4):395-408, 1969.

The microscopic anatomy of the living rat pancreas *in situ* was studied by cinephotomicrography. Blood flow through individual capillaries in both acinar and islet cell tissue was intermittent, local blood flow through acinar capillaries was regulated by smooth muscle precapillary sphincters and endothelial sphincters, and local blood flow through capillaries in islet cells was regulated by endothelial sphincters only. Insular-acinar capillary anastomoses occurred infrequently and secretory canaliculi between adjacent cells passed between centroacinar cells to reach the lumen of the ducts. Processes of beta cells passed between two adjacent cells and provided additional surface area for transcapillary exchange. The formation and release of zymogen granules occurred 45 to 90 min after stimulation of acinar cells with pancreozymin and the release of beta granules occurred 20 to 60 min after stimulation of beta cells with tolbutamide.

1573 CONTROL OF PANCREATIC XANTHINE DEHYDROGENASE SYNTHESIS IN THE CHICK. *(E.)*

Curtis, J. L. (Dept. Chem., Florida St. U., Tallahassee) and J. R. Fisher. *Biochim Biophys Acta* 201(1):26-32, 1969.

Control of pancreatic xanthine dehydrogenase synthesis was studied in pancreatic slices of day-old male chicks by use of fluorospectrophotometry. Incorporation of labeled amino acids into protein was linear for at least 1 hr regardless of the dietary history of the organism used. The amount of label incorporated into enzyme during a 2 hr exposure of slices to labeled amino acids decreased 4-fold during starvation, increased after re-feeding, and decreased again by the sixth day after refeeding. Rate of incorporation into total protein was independent of dietary history. Some agent in the diet was required for maintenance of control levels of xanthine dehydrogenase in this tissue and when the agent was removed, enzyme level and rate of synthesis dropped. Level of enzyme activity and rate of enzyme synthesis increased when agent was resupplied, i.e. by feeding. Enzyme accumulated to a level approximately double that in controls (continuously fed) and the rate of enzyme synthesis was reduced again to return activity to normal levels. An inducer seemingly was present in the diet and, in addition, a negative feedback mechanism that appeared subsequent to induction. There was no evidence of an inactive form of xanthine dehydrogenase which could be activated; therefore, the control of this activity was assumed to be at the synthesis level and possibly the degradation level.

1574 THE ULTRASTRUCTURE OF THE LIVER RETICULO-ENDOTHELIAL CELLS IN DIABETICS. *(It.-E.)*

Campeanu, S. (Inst. Dr. I. Canacuzino, Bucarest, Rumania), L. Campeanu and A. Petrovici. *Acta Diabet Lat* 6(3):534-547, 1969.

Ultrastructure of liver reticulo-endothelial cells obtained from biopsies of 28 diabetic patients and two healthy subjects was studied by electron microscopy. In diabetics, skeletal muscle small vessels presented thickening of basement membrane and proliferation of endothelial cells, with overlapping. Participation of endothelial cells in the general metabolic disturbance of diabetes mellitus is confirmed by richness in cell organelles, cell nuclei appearance and abundant and gigantic microvilli. In contrast, in healthy subjects, muscle and vessels were characterized by an unstratified endothelial layer with many pinocytotic vesicles and few prominent microvilli in vascular ducts. Liver sinusoids of diabetic patients were characterized by swollen endothelial cells and an abundance of long and tortuous microvilli. Gigantic nuclei and festooned membranes were present in all modified endothelial cells and many dense bodies, mitochondria and inclusions were found in the cell cytoplasm. Existence of liver sinusoidal endotheliopathy may be considered as an important stage in the pathogenesis of diabetes.

1575 ULTRASTRUCTURE AND OXIDATIVE PHOSPHORYLATION OF LIVER MITOCHONDRIA IN EXPERIMENTAL HEMORRHAGIC SHOCK. *(E.)* DePalma, R. G. (Case Western Reserve U. Sch. Med., Cleveland, Ohio), S. Levey and W. D. Holden. *J Trauma* 10(2):122-134, 1970.

Ultrastructure characteristics and oxidative phosphorylation of isolated liver mitochondria were studied in 50 pairs of male Sprague-Dawley rats (1 control and 1 bled) undergoing experimental hemorrhagic shock; mitochondria ultrastructure was also studied in sucrose suspensions *in vitro*. The average P/O ratios for the 2 groups of anesthetized nonbled rats were 1.81 ± .25 and 2.08 ± .38 resp. Average oxygen uptake/ mg N was 12.31 μ ATOM O/mg N±5.4 and 10.97 μ ATOM P/ mgN ± 5.04 for two groups of normal rats. Hypovolemia produced no significant differences in these 2 values. After 60 min of hypovolemia, mitochondria were swollen or globular, while in the normal hepatic cells, they were elongated or filamentous. Ultrastructural changes included clumping of nuclear chromatin, depletion of glycogen, and alterations of the rough endoplasmic reticulum with dissociation of ribosomes into the hyaloplasm. The matrix of the mitochondrion appeared less dense in shock and the cristae more widely separated. Most of the mitochondria isolated from 0.25 and 0.38 M sucrose solutions showed a condensed matrix, an extensive empty outer compartment, and large intercristal spaces. About 1-5% of the mitochondria exhibited disruption or loss of the outer membrane.

1576 LEIOMYOBLASTOMA OF THE STOMACH: AN ULTRASTRUCTURAL STUDY. *(E.)* Salazar, H. (Magee Women's Hosp., Pittsburgh, Pa.) and R. S. Totten. *Cancer* 25(1):176-185, 1970.

Three cases (2 men and 1 woman, 52 to 71 years old) of leiomyoblastoma of the stomach were studied by electron microscopy and the findings were correlated with histochemical and light microscopic characteristics. The tumor cells were large, irregular, with pleomorphic nuclei and prominent nucleoli and distinctive intranuclear inclusions were observed. The degree of development of cytoplasmic organelles was variable: the most differentiated cells had abundant cytoplasmic filaments, 60-80 Å in diameter, occasional short rows of pinocytotic vesicles, and segments of basement membrane substance or lamina externa. The cells related one to another by cytoplasmic extensions with attachment sites of opposed dense plasma membranes. The clear perinuclear spaces (typical and diagnostic of these tumors when observed by light microscopy after formalin fixation) were found in frozen sections or in gluteraldehyde-fixed tissues. Formalin-fixed material showed extensive cellular vacuolization and disintegration by electron microscopy. It appears that gastric leiomyoblastomas are of smooth muscle origin, that the perinuclear clear spaces of these tumors represent an artifact of formalin fixation, and that many tumor cells contain distinct intranuclear inclusions of undetermined nature.

1577 FRACTIONATION OF RAT LIVER TYROSINE AMINOTRANSFERASE DURING THE COURSE OF PURIFICATION: FURTHER EVIDENCE FOR MULTIPLE FORMS OF THE ENZYME. *(E.)* Sadlier, J. W. (Dept. Biochem., U. Western Australia, Nedlands), P. G. Holt and I. T. Oliver. *FEBS Letters* 6(1):46-48, 1970.

Since it has been suggested that tyrosine aminotransferase of the rat liver may consist of 3 active forms *in vivo*, the stepwise purification of the enzyme was monitored with polyacrylamide gel electrophoresis to assess possibility of artefacts arising during tissue extract manipulation. During initial purification, peaks of enzymatic activity were observed, but following hydrocortisone induction, higher levels of forms B and C were present than form A, with slight predominance of C. Further purification resulted in diminution of form A and increase in form C at final chromatography and lyophylization. Alteration during course of purification could arise by fractionation of the three initial components or by preferential denaturation of forms A and B. Progressive elimination of electrophoretic components initially found in crude liver extracts indicate that heterogeneity of soluble tyrosine aminotransferase is not an artefact of electrophoresis, of polymerization or of degradation (since artefacts usually arise during purification). Immunological characterization of tyrosine aminotransferase may require close investigation since purification appears to select one form and an antibody to this form may cross-react with other enzyme forms.

1578 SEPARATION OF RAT LIVER MITOCHONDRIAL AMINE OXIDASES. *(E.)* Gorkin, V. Z. (Acad Med. Sci. USSR, Moscow). *Experientia* 25(11):1142-1143, 1969.

Separation of rat liver mitochrondrial amine oxidases was performed by initial disintegration of mitochondrial membranes by sonication and separation of resulting particles by column electrophoresis. Fractions of monamine substrates separated with an electrophoretic run of 65 hr included 5-hydroxytryptamine, tyramine, p-nitrophenyl ethylamine, kynuramine and m-nitro-p-hydroxylbenzylamine. Similar results were observed with longer (up to 85 hr) but not shorter (24-48 hr) electrophoretic runs. Separation of amine oxidases was observed in urea-treated, sonicated rat liver mitochondria with a density gradient electrophoresis run of 43 hr.

1579 EFFECTS OF PHOSPHOTUNGSTIC ACID AND SILICOTUNGSTIC ACID ON RESPIRATION AND INTEGRITY OF RAT LIVER MITOCHONDRIA. *(E.)* Catterall, W. A. (Johns Hoskins U. Sch. Med., Baltimore, Md.) and

. L. Pedersen. *Biochem Biophys Res Commun* 38(3):
00-405, 1970.

he effects of phosphotungstic acid and silicotung-
tic acid on respiration and integrity of intact
itochondria and submitochondrial particles were
tudied in rat liver suspensions using polarogra-
hic methods. Phosphotungstic acid and silicotung-
tic acid at low concentrations ($\leq$ 0.2 mg/mg pro-
ein), markedly inhibited mitochrondrial respira-
ion stimulated by either ADP or 2,4-dinitrophenol.
he negative staining agents solubilized signifi-
ant amounts of mitochondrial protein at higher
oncentrations. Although the mechanism of action
as not been determined, phosphotungstic acid and
ilicotungstic acid apparently are not inert with
espect to structure and function of the mitochon-
rial membrane system.

580 ULTRASTRUCTURE OF THE RAT EXOCRINE PANCREAS AFTER LONG TERM INTAKE OF ETHANOL.
E.) Ekholm, R. (Dept. Anat., U. Goteborg, Sweden),
. Darle and Y. Edlund. *Gastroenterology* 58(1):
2-72, 1970.

ltrastructural changes in the exocrine pancreas
ells (possibly indicative of metabolic distur-
ances) were studied in 17 Sprague-Dawley male
ats (and 5 controls). During the experimental
eriod (14 to 53 weeks) ethanol in increasing con-
entrations was substituted for drinking water.
acroscopically, the pancreas appeared normal in
ll animals. Pancreatic tissue, fixed *in vivo*,
howed 3 types of pathological change. Starting
fter 14 weeks exposure to alcohol, large numbers
f lipid droplets in the acinar cells were found in
ll experimental animals and tended to increase in
umber and size with increased duration of alcohol
xposure. After 36 weeks, examination revealed a
welling of acinar cell mitochondria and a reduc-
ion of their inner membranes, and foci of cyto-
lasmic degradation in acinar, centroacinar, and
uct cells. The most conspicuous pathological al-
eration in liver tissue from 3 animals exposed to
lcohol for 53 weeks was the occurrence of a large
umber of lipid droplets (kidneys showed no patho-
logical changes).

1581 RAT HEPATOMA CELL SURFACE ANTIGENS: DEMONSTRATION AND ISOLATION OF MEMBRANE-ASSOCIATED ISOANTIGENS. *(E.)* Baldwin, R. W. (British Empire Cancer Campaign Res. Lab., U. Nottingham, England) and M. Moore. *Europ J Cancer* 5(5):475-483, 1969.

Absorption and indirect immonofluorescence methods were used to determine normal isoantigenic components in membrane fractions from strain-specific transplanted hepatomas from 3-month-old Slonaker and Wistar rats. Antisera against contaminating tumors were injected during the 2 to 8 month period of investigation. The retention of isoantigenic specificities in particulate fractions was confirmed by their ability to inhibit immunofluorescence reactions of antibodies directed against antigenic determinants expressed on the cell surface, and by elaboration of a humoral antibody response on inoculation into allogenic recipients. The soluble fraction of the cell was inactive. Isoantigens are apparently expressed on the cell surface and may be isolated in association with the particulate fraction of hepatoma cells in rats.

1582 HISTOCHEMICAL AND ELECTRON MICROSCOPICAL STUDIES ON THE EPITHELIUM OF THE FETAL COLON WITH SPECIAL REFERENCE TO THE OCCURENCE OF LIPIDS. *(E.)* Garbarsch, Ch. (Anat. Dept. A., U. Copenhagen, Denmark) and F. A. von Bulow. *Histochemie* 20(3):201-210, 1969.

Histochemistry and ultrastructure of absorbing cells of the colon were studied in 32 human fetuses. Cellular ultrastructure included: microvilli with a fuzz, lateral specializations, small mitochondria found at peripheral cell parts, apically placed lysosomes, basally placed lipid droplets and disperse accumulations of glycogen. Signs of pinocytosis were observed and Golgi cisternae and endoplasmic reticulum are often poorly developed. Prenatal human colon seemingly participates in absorption and metabolism of some substances, including lipids.

1583 HEPATIC ALLOGRAFTS AND XENOGRAFTS IN PRIMATES. *(E.)* Calne, R. Y. (Dept. Surg. U. Cambridge, England), D. R. Davis, J. R. Pena, H. Balner, M. DeVries, B. M. Herbertson, V. C. Joysey, P. R. Millard, M. J. Seaman, J. R. Samuel, J. Stibbe and D. L. Westbroek. *Lancet* 1(7638):103-106, 1970.

Rejection and effects of immunosuppression were studied in hepatic allografts and xenografts in primates. Orthoptic liver allografts in rhesus monkeys with no immunosuppression were rejected at 7, 8, and 15 days in 3 animals, while a fourth monkey died at 7 months from cholangitis and little evidence of rejection. A rhesus monkey with a liver allograft and treated with antilymphocyte serum, survived 3 months with death resulting from pneumonia and liver abscesses. Another rhesus monkey with a liver xenograft from a cyanamolgus monkey and treated with antilymphocyte serum, survived only 3 weeks (liver showed marked cellular infiltration and focal necrosis). Extensive intravascular coagulation was observed in liver xenografts from pig-to-rhesus monkey and pig-to-chimpanzee. The value of antilymphocyte serum treatment in rhesus-liver allografts is difficult to assess due to diverse results in animals with no immunosuppression. Extensive coagulation may indicate bleeding tendency during liver transplantation from pig-to-primate and failure of pig-to-primate xenografts is presumably due to species incompatibility.

1584 HISTOCHEMICAL STUDIES ON THE EFFECT OF SOME ANAESTHETICS ON RAT LIVER. *(E.)* Ramadan, M. A. (Med. Res. Inst. Alexandria, UAR) and M. I. A. Ramadan. *Acta Histochem* 34(2):310-316, 1969.

1585 HEPATIC SEGMENTATION. SEGMENTED ANATOMY OF THE LIVER. *(It.)* Gimenez, R. E. (Med. Fac., Region. U. Cordoba, Argentina). *Ann Ital Chir* 45(2):334-341, 1969.

1586 THE UNIQUE DISTRIBUTION OF ORNITHINE AMINOTRANSFERASE IN RAT LIVER MITOCHONDRIA. *(E.)* Swick, R. W. (Dept. Nutr. Sci., U. Wisconsin, Madison), S. L. Tollaksen, S. I. Nance and J. F. Thomson. *Arch Biochem Biophys* 136(1): 212-218, 1970.

1587 EFFECTS OF THE PRE-INCUBATION IN A Na$^+$-FREE MEDIUM ON THE O$_2$ UPTAKE AND GLUCOSE UTILIZATION BY THE INTESTINE. *(E.)* Jordana, R. (Dept. Physiol. Sci. Fac., U. Navarra, Pamplona, Spain) and F. Ponz. *Rev Esp Fisiol* 25(4):225-232, 1969.

1588 DETERMINATION OF THE QUANTITATIVE RELATIONSHIP OF OUTER AND INNER MEMBRANE PROTEINS IN RAT LIVER MITOCHONDRIA BY MEANS OF ENZYMOLOGY AND ELECTRON MICROSCOPY. *(E.)* Brunner, G. (Inst. Physiol. Chem. Phys. Biochem., U. Munich, Germany) and T. Bucher. *FEBS Letters* 6(2):105-108, 1970.

1589 THE REDOX STATE OF FREE NICOTINAMIDE-ADENINE DINUCLEOTIDE PHOSPHATE IN THE CYTOPLASM OF RAT LIVER. *(E.)* Veech, R. L. (Radcliffe Infirm., Oxford, England), L. V. Eggleston and H. A. Krebs. *Biochem J* 115(4):609-619, 1969.

1590 THE ISOLATION AND CHARACTERIZATION OF A NEW FORM OF PORCINE PANCREATIC CARBOXYPEPTIDASE A (CARBOXYPEPTIDASE A$_e$). *(E.)* Narayanan, A. S. (Dept. Biochem., U. Toronto, Ontario, Canada) and R. A. Anwar. *Canad J Biochem* 48(1):1-11, 1970.

1591 THE PERMISSIVE ROLE OF CORTISOL IN THE REGULATION OF RAT LIVER TYROSINE AMINOTRANSFERASE. *(E.)* Mavrides, C. (Fac. Med., U. Ottawa, Canada) and E. A. Lane. *Canad J Biochem* 48(1):12-19, 1970.

1592 THE INFLUENCE OF AMINONUCLEOSIDE ON POLYSOME PATTERNS OF RAT LIVER. *(E.)* Kovacs, E. S. (Dept. Path., U. Toronto, Ontario, Canada), S. D. Kung and M. A. Moscarello. *Canad J Biochem* 48(1):39-43, 1970.

1593 DEMONSTRATION OF ALKALINE PHOSPHATASE IN THE LYSOSOMES OF NEONATE RAT ILEUM. *(E.)* Williams, R. M. (London Hosp. Med. Coll., England) and F. Beck. *Histochem J* 1(6):531-538, 1969.

1594 NATURALLY OCCURRING TUMORS AND OTHER LESIONS OF THE DIGESTIVE TRACT IN UNTREATED C57BL MICE. *(E.)* Rowlatt, C. (Imperial Cancer Res. Fund, London, England), L. M. Franks, M. U. Sheriff and F. C. Chesterman. *J Nat Cancer Inst* 43(6):1353-1364, 1969.

1595 THE EFFECT OF *LANTANA CAMARA* ON THE LIVER OF SHEEP. *(E.)* Gopinath, C. (Dept. Vet. Clin. Stud., U. Liverpool, Leahurst, Cheshire, England) and E. J. H. Ford. *J Path* 99(1):75-85, 1969.

1596 DISTRIBUTION OF ^{198}Au COLLOID IN HEPATIC CELL. *(Jap.)* Nagase, K. (Juntendo U. Sch. Med., Japan) and A. Hashimoto. *Nippon Acta Radiol* 29(5):491-501, 1969.

1597 LIVER CIRCULATION AND FUNCTION: CHANGES IN LIPIDS OF RAT LIVER FOLLOWING LIGATION OF LIVER LOBE. *(E.)* Yangiamoto, Y. (Osaka City U. Med. Sch., Japan), S. Nakahama and Y. Noda. *Ann Histochim* 14(3):215-223, 1969.

1598 LIVER CIRCULATION AND FUNCTION: OBSERVATION OF ENZYMATIC ACTIVITY IN LIGATED RAT LIVER LOBES. *(E.)* Noda, Y. (Osaka City U. Med. Sch., Japan), Y. Yangiamoto and S. Nakahama. *Ann Histochim* 14(3):225-230, 1969.

1599 LIVER CIRCULATION AND FUNCTION: CHANGES IN PHOSPHORYLASE ACTIVITY FOLLOWING LIVER LOBE LIGATION. *(E.)* Yangiamoto, Y. (Osaka City U. Med. Sch., Japan), S. Nakahama and Y. Noda. *Ann Histochim* 14(3):231-235, 1969.

1600 LIVER CIRCULATION AND FUNCTION: CYTO- AND BIOCHEMICAL STUDIES OF LIVER GLYCOGEN ON A LIVER LOBE LIGATION. *(E.)* Yangiamoto, Y. (Osaka City U. Med. Sch., Japan). *Ann Histochim* 14(3):265-273, 1969.

1601 SEMIMICROASSAY METHOD FOR HEPATIC δ-AMINOLEVULINIC ACID SYNTHETASE ACTIVITY. *(E.)* Levere, R. D. (Downstate Med. Ctr., Brooklyn, N. Y.), E. L. Gitin and S. Sassa. *J Lab Clin Med* 75(1):137-144, 1970.

1602 THE UTILIZATION OF GENES FOR RIBOSOMAL RNA, 5S RNA, AND TRANSFER RNA IN LIVER CELLS OF ADULT RATS. *(E.)* Quincey, R. V. (Dartmouth Med. Sch., Hanover, New Hampshire) and S. H. Wilson. *Proc Nat Acad Sci USA* 64(3):981-988, 1969.

1603 NUCLEOSIDE DIPHOSPHATASE IN PURIFIED PREPARATIONS OF RAT LIVER LYSOSOMES. *(E.)* Wattiaux-de Coninck, S. (Lab. Physiol. Chem., U. Notre-Dame de la Paix, Namur, Belgium) and R. Wattiaux. *FEBS Letters* 5(5):355-359, 1969.

1604 PURIFICATION AND PROPERTIES OF 6-PHOSPHOGLUCONATE DEHYDROGENASE FROM SHEEP LIVER. *(E.)* Villet, R. H. (Div. Biol., Cal. Tech., Pasadena, Calif.) and K. Dalziel. *Biochem J* 115(4):639-643, 1969.

1605 DISSECTING MICROSCOPY OF RECTAL MUCOSA. *(E.)* Bank, S. (Groote Schuur Hosp., Cape Town, South Africa), D. G. Burns, J. S. Cobb and I. N. Marks. *Lancet* 1 (7637):64-65, 1970.

1606 THE INFLUENCE OF LOW TEMPERATURE AND STORAGE TIME ON SOME HISTOCHEMICALLY DEMONSTRABLE ENZYME ACTIVITIES IN LIVER, KIDNEY, AND JEJUNUM OF THE RAT. *(Ger.)* Riecken, E. O. (Med. U. Marburg, Germany), H. Goebell and C. Bode. *Histochemie* 20(3):225-233, 1969.

1607 PREPARATION AND SOME PROPERTIES OF ACTIVE SUBUNITS FROM RAT LIVER RIBOSOMES. *(E.)* Terao, K. (Niigata U. Sch. Med., Japan) and K. Ogata. *Biochem Biophys Res Commun* 38(1):80-85, 1970.

1608 EXPERIMENTAL STUDIES WITH GASTRIC FREEZING -- HISTOCHEMICAL EXAMINATION OF GASTRIC MUCOSA AND EFFECT OF GASTRIC FREEZING ON THE GASTRIC SECRETORY CHANGES BY pH INDICATOR METHOD. *(Jap.)* Aisawa, R. (Iwate Med. U., Japan). *Arch Jap Chir* 38(5):739-759, 1969.

1609 ELECTRON MICROSCOPIC OBSERVATIONS OF THE ESOPHAGEAL MUCOUS EPITHELIUM IN THE MOUSE. *(Jap.)* Muto, H. (Nagoya City U. Med. Sch., Japan). *Med Biol* 79(6):239-242, 1969.

1610 KINETIC STUDIES OF LIVER XANTHINEDEHYDROGENASE: I. ACTIVITIES WITH PURINE SUBSTRATES. *(Sp.)* Domingo, E. (Dept. Biochem., Fac. Sci., U. Barcelona, Spain), J. Bozal and F. Calvet. *Rev Esp Fisiol* 25(4):275-286, 1969.

1611 MEAN INTRACELLULAR HYDROGEN ION ACTIVITY IN THE WHOLE BODY, LIVER, HEART AND SKELETAL MUSCLE OF THE RAT. *(E.)* Walker, W. D. (St. Vincent's Hosp., Sydney, Australia), F. J. Goodwin and R. D. Cohen. *Clin Sci* 36(3):409-417, 1969.

1612 EARLY EFFECTS OF FEEDING EXCESS VITAMIN A ON GLUCONEOGENESIS: INCORPORATION OF ^{14}C-LABELED PRECURSORS INTO BLOOD GLUCOSE AND LIVER GLYCOGEN. *(E.)* Singh, M. (Vallabhbhai Patel Chest Inst., U. Delhi, India), V. N. Singh and T. A. Venkitasubramanian. *Indian J Biochem* 6(3):150-152, 1969.

1613 EFFECT OF pH CHANGES ON THE CARDIAC SPHINCTER. *(E.)* Giles, G. R. (Dept. Surg., U. Leeds, London, England), C. Humphries, M. C. Mason, and C. G. Clark. *Gut* 10(10):852-856, 1969.

1614 MICROSOMAL-ENZYME STIMULATION IN MAN BY B.H.T. *(E.)* Sharratt, M. (British Industrial Biol. Res. Ass., Carshalton, Surrey, England), S. D. Gangolli and P. Grasso. *Lancet* 1 (7637):89, 1970.

1615 PHOSPHOLIPID CLASS AND FATTY ACID COMPOSITION OF GOLGI APPARATUS ISOLATED FROM RAT LIVER AND COMPARISON WITH OTHER CELL FRACTIONS. *(E.)* Keenan, T. W. (Dept. Anim. Sci., Purdue U., Lafayette, Ind.) and D. J. Morre. *Biochemistry* 9(1):19-25, 1970.

1616 SOME PROPERTIES OF CYTOCHROME b_5 FROM LIVER MICROSOMES OF MAN, MONKEY, PIG AND CHICKEN. *(E.)* Nobrega, F. G. (Dept. Biochem., U. San Paulo, Brazil), P. S. Araujo, M. Pasetto and I. Raw. *Biochem J* 115(4):849-856, 1969.

1617 LOCALIZATION OF ACID AND ALKALINE PHOSPHATASE ACTIVITIES IN THE DUODENUM OF THE CHICK. *(E.)* Hugon, J. S. (Med. Fac., U. Sherbrooke, Quebec, Canada) and M. Borgers. *Acta Histochem* 34(2):349-359, 1969.

1618 INTERACTION OF POLYPEPTIDE CHAIN ELONGATION FACTORS WITH RAT LIVER RIBOSOMAL SUBUNITS. *(E.)* Rao, P. (U. Pittsburgh Sch. Med., Pa.) and K. Moldave. *J Molec Biol* 46(3):447-457, 1969.

1619 A MODIFIED METHOD FOR THE ISOLATION OF THE PLASMA MEMBRANE FROM RAT LIVER. *(E.)* Ray, T. K. (U. Rochester Sch. Med. Dent., N. Y.). *Biochim Biophys Acta* 196(1):1-9, 1970.

1620 CALCIUM ION-INDUCED UPTAKES AND TRANSFORMATIONS OF SUBSTRATES IN LIVER MITOCHONDRIA. *(E.)* Harris, E. J. (Dept. Biophys., U. Coll., London, England) and C. Berent. *Biochem J* 115(4):645-652, 1969.

1621 THE ACTION OF PHENYLBUTAZONE ON THE MITOTIC ACTIVITY OF GASTRIC ANTRUM CELLS. *(E.)* Bucciarelli, G. (Inst. Path. Spec., U. Firenze, Italy), G. Biliotti, F. Andreoli, C. Masi and E. Micheli. *Sperimentale* 118(6):469-474, 1968.

1622 STUDIES ON THE PERMEABILITY OF RAT LIVER LYSOSOMES TO CARBOHYDRATES. *(E.)* Lloyd, J. B. (U. Miami Sch. Med., Fla.). *Biochem J* 115(4):703-707, 1969.

1623 ELECTROPHORETIC PATTERNS OF RIBOSOMAL PROTEINS FROM LIVER AND HEPATOMAS. *(E.)* Chiarugi, V. P. (Inst. Path. Gen., U. Firenze, Italy) and C. Lorenzoni. *Sperimentale* 118(6):475-482, 1968.

- P:Secr:Panc (1683)(1684)(1685)(1687)
- P:Secr:Hepatobil (1695)(1696)(1699)(1705)(1708)(1730)(1731)(1732)(1733)(1735)(1736)(1737)(1741)(1742)(1767)(1769)(1776)(1777)(1778)(1779)(1780)
- P:Secr:Int (1784)(1785)
- D:S.Intest (1933)
- D:Livbil (2035)(2064)(2079)
- D:Livbil:A.V.Hep (2123)

1624 FAT ABSORPTION STUDIES IN HEALTH AND DIABETES MELLITUS. *(E.)* Kunwar, K. B. (no affil), S. P. S. Teotia, A. N. Dass and M. Teotia. *J Ass Physician India* 17(10:563-572, 1969.

Chemical fat balance methods were used to study fat absorption in 18 healthy and 27 diabetic patients. All healthy controls showed fecal excretion of fat below 7.0 g%. Only 4 of 27 diabetic patients had an increased fecal excretion of fat (2 patients showed mild steatorrhea of 9.0 and 7.9 g%, resp.) 1 patient showed moderate steatorrhea of 15.4 g% and 1 patient had severe steatorrhea of 22.7 g% per day). All 4 patients were thinly built, and had uncontrolled and long standing diabetes with complicating peripheral neuropathy. Fecal fat decreased from 15.4% to 10.2% in one patient with moderate steatorrhea after insulin therapy. The possibility of a coincidental association of diabetes mellitus with sprue could not be supported by case histories or laboratory tests. Differentiation of diabetic diarrhea and diabetic steatorrhea is thought to be important in prognosis.

1625 VITAMIN B_{12} ABSORPTION AND GASTRIC ANTIBODIES IN RHEUMATOID ARTHRITIS. *(E.)* Couchman, K. G. (Palmerston North Med. Res., Found. Lab., New Zealand), L. Bieder, R. D. Wigley and A. G. Glenday. *New Zeal Med J* 68(436):153-156, 1968.

Vitamin B_{12} absorption and parietal cell antibodies were studied in 52 patients (42 women and 10 men) with rheumatoid arthritis and in 52 age and sex matched controls. The Schilling test showed that vitamin B_{12} absorption below the accepted control range of 13-52% occurred in 15 patients (13 women and 2 men). There was a significant difference in the Schilling test score between controls and rheumatoid arthritis cases in the over 65 age group with the difference being significant for females. Increased absorption of vitamin B_{12} occurred in 7 of 10 arthritic patients given 300 mg of hog intrinsic factor. There was a significant correlation between Schilling test scores below 5% and a low hemoglobin or packed cell volume when tested in an analysis of variance. Parietal cell antibodies were found in 8 of 43 patients and one of 23 controls and the incidence of antibodies was significantly higher where the Schilling test was below 13%. Low vitamin B_{12} absorption was more common in the over 65 age group and 5 of 10 of these patients had parietal cell antibodies. Possible explanations for less efficient vitamin B_{12} absorption in older rheumatoid arthritic patients include lack of intrinsic factor due to atrophic gastritis or gastric atrophy, intrinsic factor antibody, the effect of drugs, or an as yet undisclosed mechanism (the lack of intrinsic factor is seemingly the most probable on present evidence).

1626 OBSERVATIONS ON THE INTESTINAL ABSORPTION OF SOME OLIGOPEPTIDES OF METHIONINE AND GLYCINE IN THE RAT. *(E.)* Matthews, D. M. (Westminster Med. Sch., London, England), M. T. Lis, B. Chang and R. F. Crampton. *Clin Sci* 37(3)751-764, 1969.

The rates of absorption of peptides (L-methionyl-L-methionine, L-methionyl-L-methionyl-L-methionine, L-methionyl-glycine, glycyl-L-methionine, L-methionylglycycl-L-methionine) and their constituent amino acids from the small intestine was studied in rats by paper chromatography. The absorption of glycine, methionine and di- and trimethionine from these peptides was as rapid at low concentrations, and more rapid at high concentrations, than absorption from equivalent amounts of free amino acids. All of the peptides including the three mixed peptides of glycine and methionine were absorbed intact from the intestinal lumen. When the mixed peptides of glycine and methionine were introduced into the small intestine, the competitive inhibition of glycine transport by methionine which occurs in the corresponding amino acid mixtures is partly or completely avoided. The uptake of oligopeptides may be an important mode of absorption of protein digestion products.

1627 COUNTERCURRENT EXCHANGE IN THE SMALL INTESTINE. *(E.)* Lundgren, O. (Dept. Physiol, U. Goteborg, Sweden). *Amer Heart J* 79(2): 285-288, 1970.

A series of experiments was performed on cats to test the hypothesis that a countercurrent exchange mechanism exists in the small intestine. In one experiment (designed to analyze intestinal blood flow by means of the inert gas washout technique) the composite γ curve, registered after an intra-arterial injection of a ^{85}Kr solution, exhibited a large and extremely fast first component. To obtain evidence for a shunting of O_2 similar to that of Kr between the 2 limbs of the mucosal vascular loops, the venous appearance time of intra-arterially injected O_2 was compared with that of similarly administered methemoglobinemic red cells. O_2 appeared 1 to 2 sec earlier than the labeled red cells in the mesenteric vein during resting conditions. Another series of experiments showed that there was a comparatively lower solute concentration at the tips of the villi than at their bases after intra-arterial injection of ^{14}C-antipyrine, 4-iodoantipyrine, ^{14}C-urea and ^{86}Rb. Slow elimination from the villi was demonstrated at low and moderate intestinal blood flow levels for Kr, ^{14}C-urea and ^{14}C-antipyrine. An intestinal countercurrent exchange appears to exist which affects absorption via arterial blood and which hinders the transport of O_2 to the tips of the intestinal villi from their bases toward their tips. The proposed exchange may be an important factor in the rapid turnover of intestinal epithelial cells.

1628 INTESTINAL ABSORPTION OF ^{3}H-OUABAIN: DEMONSTRATION OF A NONSATURABLE TRANSPORT PROCESS. *(E.)* Greenberger, N. J. (Ohio St. U. Hosp., Columbus), J. H. Caldwell and T. C. Halpin. *J Lab Clin Med* 75(1):43-52, 1970.

The intestinal absorption of ^{3}H-ouabain was studied in female Wistar rats using isolated intestinal loops *in vivo* and everted gut sacs *in vitro*. Ouabain absorption was linear and followed first order kinetics *in vivo* and *in vitro* over a wide range of concentrations. When ouabain concentration was increased from 8.56 to 171.2 mμ moles/ml, *in vivo* absorption increased from 1.7 to 24.5 mμ moles/100 g body weight. Increasing the *in vitro* concentration of ouabain from 1.0 x 10^{-8} to 1.0 x 10^{-3} resulted in an increase in mucosal to serosal transport from 0.5±0.2 to 54,763±15,462 μμ moles. In the *in vitro* studies, ouabain transport was not significantly altered by the omission of oxygen or glucose or the addition of dinitrophenol (5.0 x 10^{-4}M), sodium azide (1.0 x 10^{-2}M) or iodoacetate (5.0 x 10^{-4}M) to the incubation media. When sodium in the incubation medium was entirely replaced by potassium (150 mM), ouabain transport was decreased from 32.9±14.4 to 20.6±11.7 μμ moles; substitution of LiCl for NaCl (125 mM) and $KHCO_3$ for $NaHCO_3$ (25 mM) increased ouabain transfer to 47.3±15 μμ moles. Transport against a concentration gradient and competition between ouabain and digoxin were not observed. Subcellular distribution studies using labeled digitoxin, digoxin and ouabain showed similar results for all 3 compounds. Nearly all the recovered radioactivity was found in the soluble supernatant fraction, and the residual radioactivity was not consistently associated with any particulate fraction. Ouabain appears to absorbed by a passive, nonsaturable transport process even at low substrate concentrations.

1629 WATER AND ELECTROLYTE TRANSPORT IN THE DOG'S ILEUM DURING SODIUM DEPLETION. *(E.)*

Clarke, A. M. (U. Otago. Med. Sch., Dunedin, New Zealand) and R. G. McKenzie. *Proc U Otago Med Sch* 47(3):78-79, 1969.

The effects of sodium depletion on the intestinal transport of H^+, NH_4^+, Cl^- and HCO_3^- were studied on the isolated Thiry-Vella loop of the ileum in a female dog. During control experiments the mean urinary Na^+ excretion was 68 mEq/l and the mean urinary Na/K ratio was 1:2. During Na depletion, the mean urinary Na^+ excretion was 2.2 mEq/l and the mean Na/K ratio was 0:42. The urinary Cl^- excretion was decreased and there was an increase in urinary excretion of NH_4^+ and H^+.

1630 THE EFFECT OF ALDOSTERONE ON MUCOSAL TRANSFER OF SODIUM, POTASSIUM AND WATER IN THE JEJUNUM AND ILEUM OF THE RAT *IN VITRO. (E.)*

Hill, G. L. (Otago Med. Sch., Dunedin, New Zealand) and A. M. Clarke. *Proc U Otago Med Sch* 47(3):76-77, 1969.

The *in vitro* effects of maximal doses of aldosterone on the mucosal transfer of sodium, potassium and water in the jejunum and ileum were studied in 31 male Wistar rats deprived of food for 24 hr. Sixteen control animals received 0.1 ml of 0.9% NaCl i.v., and 15 experimental animals received 0.1 ml of 0.9% NaCl containing 50 μg of aldosterone. Mucosal transfer of sodium, potassium and water was significantly increased in the isolated ileum following aldosterone treatment and there was a marginally significant increase in the jejunum.

1631 NET MOVEMENTS OF MAGNESIUM AND CALCIUM IN THE RAT SMALL INTESTINE *IN VIVO. (E.)*

Urban, E. (U. Texas Med. Sch., San Antonio) and H. P. Schedl. *Proc Soc Exp Biol Med* 132(3):1110-1113, 1969.

Male Simonsen rats (300-425 g) were used for the comparison of *in vivo* duodenojejunal and ileal magnesium absorption and secretion, using a perfusion technique under controlled conditions. Mg absorption from intestinal fluid occurred after perfusion with high (2.5 mM $MgCl_2$) Mg perfusate but not after perfusion with low (0.25 mM $MgCl_2$) or zero Mg perfusate. Net magnesium absorption per unit weight of intestinal segment was significantly greater in the duodenum than in the ileum. Comparisons with previous similar studies of calcium transport show the magnesium was less well absorbed than calcium in the duodenum; ileal absorption rates were almost equal. Tissue concentrations of magnesium were higher in the duodenum than in ileum, the reverse of the pattern for calcium. Transported Mg did not influence tissue calcium or calcium secretion into the intestinal lumen.

1632 TOTAL RECOVERY STUDIES OF NONABSORBABLE INDICATORS IN THE RAT SMALL INTESTINE. *(E.)*

Miller, D. L. (Dept. Intern. Med., U. Iowa, Iowa City) and H. P. Schedl. *Gastroent* 58(1): 40-46, 1970.

Polyethylene glycol, phenol red, polyethylene glycol-^{14}C, inulin-carboxyl-^{14}C, and mannitol-1-^{14}C were compared as nonabsorbable indicators after perfusion through the lumen of the *in situ* small intestine of adult male albino rats. Mean total recoveries from the gut lumen for all indicators were more than 95% except for tracer mannitol-1-^{14}C (when carrier mannitol was added, recovery of mannitol-1-^{14}C was satisfactory). Polyethylene glycol and phenol red were 97-98% recovered. Total indicator serum recoveries from serum and urine could not explain the 2-3% loss of indicator and if recovery data are a valid measure of indicator absorption, indicators underestimate net water absorption by 2-3%. Labeled indicators inulin-^{14}C and polyethylene glycol-^{14}C were the most promising indicators tested since they were easily analyzed, well recovered and essentially nonabsorbed.

1633 THE EFFECT OF THE RENIN-ANGIOTENSIN SYSTEM ON MUCOSAL WATER AND SODIUM TRANSFER IN EVERTED SACS OF RAT JEJUNUM. *(E.)*

Crocker, A. D. (Dept. Pharm., U. Aston, Birmingham, England) and K. A. Munday. *J Physiol* 206(2):323-333, 1970.

Everted 15 cm sacs of male Wistar rat jejunum were used for the measurement of mucosal water and sodium transfer. Rats maintained on a high sodium diet did not show consistently reduced mucosal water transfer; aldosterone also failed to stimulate transfer unless the control untreated values were low. Adrenalectomy produced little reduction in mucosal water transfer, and aldosterone showed no effect on water transfer in sacs from adrenalectomized rats. Vasopressin had no effect on mucosal transfer. Levels of water transfer were not reduced after hypophysectomy nor did aldosterone injection increase transfer. Mucosal water transfer in sacs from adrenalectomized-nephrectomized rats was low and was significantly (90%) increased by aldosterone injection or by injection of crude kidney extract (65% increase). A 45% increase in mucosal water and sodium transfer was observed when sacs from adrenalectomized-nephrectomized rats were incubated with angiotensin at a concentration of 10^{-10}g/ml. This is the first report that angiotensin, an extra-adrenal factor, might also be involved in this mechanism. Not only aldosterone but also the renin-angiotensin system may be involved in the maintenance of sodium homeostasis by a direct action on sodium transporting mechanisms.

1634 BILE SALT-INDUCED PERMEABILITY CHANGES IN THE ISOLATED RAT INTESTINE. *(E.)* Feldman, S. (Sch. Pharm., Temple U., Philadelphia, Pa.) and M. Gibaldi. *Proc Soc Exp Biol Med* 132(3):1031-1033, 1969.

The effects of lecithin and fat digestion products on permeability were studied in rat everted jejunal segments incubated in a medium containing 10 mM sodium taurodeoxycholate alone or in the presence of various concentrations of egg lecithin or oleic acid and glyceryl monooleate. After incubation, the segments were placed in a medium containing 2.0 mg/ml of sodium salicylate. Mean transfer rate (µg/min) was 30±3 for control segments, 78±8 with sodium taurodeoxycholate, 51±3 with sodium taurodeoxycholate and 10 mM lecithin, and 64 with sodium taurodeoxycholate and 6 mM oleic acid and 4 mM glyceryl monooleate. After incubation with sodium taurodeoxycholate alone, the intestinal mucosal surface became blanched and somewhat translucent but when lecithin or oleic acid and glyceryl monooleate were included in the incubation media, the changes in the appearance of the intestinal mucosa were prevented.

1635 IRON ABSORPTION IN APPARENTLY HEALTHY MEN AND WOMEN: III. STUDIES IN IRON ABSORPTION. *(E.)* Hoglund, S. (Karolinska Hosp., Stockholm, Sweden). *Acta Med Scand* 186(6):487-491, 1969.

1636 PHYSIOCHEMICAL PROPERTIES AND GASTROINTESTINAL ABSORPTION OF DRUGS. *(E.)* Lien, E. J. (Sch. Pharm., U. Southern California, Los Angeles). *Drug Intelligence Clin Pharm* 4(1):7-9, 1970.

1637 DISTENSION OF THE PYLORIC ANTRUM AS A STIMULUS FOR GASTRIN RELEASE. *(E.)* Sugawara, K. (Coll. Med., U. Florida, Gainesville), J. Isaza, J. R. Curt and E. R. Woodward. *Arch Surg* 100(2):201-204, 1970.

1638 CARBOHYDRATE DIGESTION AND ABSORPTION. *(E.)* Gray, G. M. (Stanford U. Sch. Med., Calif.). *Gastroenterology* 58(1):96-107, 1970.

1639 THE DIFFERENCE IN SENSITIVITY TO CARDIAC STEROIDS OF $(Na^{+}+K^{+})$-STIMULATED ATPASE AND AMINO ACID TRANSPORT IN THE INTESTINAL MUCOSA OF THE RAT AND OTHER SPECIES. *(E.)* Robinson, J. W. L. (Venezuelan Inst. Sci. Invest., Caracas). *J Physiol* 206(1):41-60, 1970.

1640 MUCOSAL EQUILIBRIUM IN IRON EXCRETION FROM GASTRIC MUCOSA. *(Jap.)* Kimura, I. (Okayama U. Med. Sch., Japan), M. Yamana and A. Nishishita. *Med Biol* 79(6):247-252, 1969.

1641 RENAL AND HEPATIC TRANSPORT OF FOOD DYES. *(E.)* Despopoulos, A. (Sch. Med., U. New Mexico, Albuquerque). *J Pharmacol Exp Ther* 163(1):222-228, 1968.

1642 EFFECTS IN THE RAT OF THE SIMULTANEOUS INGESTION OF LACTOSE AND ^{65}Zn ON THE ABSORPTION AND RETENTION OF THE ELEMENT. *(Fr.)* Fournier, P. (Paris, France). *C R Acad Sci* 269(20):2001-2003, 1969.

1643 THE CONTRIBUTIONS OF ANEROBIC MECHANISMS TO HYDROGEN ION TRANSPORT IN THE DOG STOMACH. *(E.)* McQuarrie, D. G. (VA Hosp., Minneapolis, Minn.) and J. A. Vennes. *J Lab Clin Med* 75(1):61-73, 1970.

- P:Morph (1587)
- P:Motil (1646)(1662)
- P:Secr:Stom (1674)
- P:Secr:Hepatobil (1718)
- D:Stomduo (1857)(1876)(1886)(1899)
- D:Stomduo:Peptulc (1913)
- D:S.Intest (1942)
- D:S.Intest:Malabs (1963)

1644 THE EFFECT OF PENTAGASTRIN ON GASTRIC MOTILITY FOLLOWING VAGOTOMY. *(E.)*

Sugawara, K. (U. Florida Coll. Med., Gainesville), J. Isaza, J. Curt and E. R. Woodward. *J Surg Res* 10(2):73-80, 1970.

Gastric motility was measured from air-filled balloons in the antral pouch during i.v. pentagastrin administration (either as a 1 hr continuous infusion of 3 μg/kg or as a single 1 μg/kg injection) before and after vagotomy in dogs with a Heidenhain pouch and a vagally innervated isolated antral pouch. After transthoraic vagotomy, the amplitude of antral contractions was significantly reduced but contraction frequency was unchanged. The frequency of contractions before and after vagotomy was increased before and after vagotomy by both continuous infusion and single injection of pentagastrin infusion before vagotomy. The amplitude of antral contractions and contraction pressure was increased by pentagastrin infusion after vagotomy. Pentagastrin infusion did not alter the secretory response of Heidenhain pouch before or after vagotomy.

1645 MOTILITY CHARACTERISTICS OF INNERVATED AND DENERVATED ANTRAL POUCHES IN DOGS: RESPONSE TO ANTRAL DISTENTION AND PENTAGASTRIN ADMINISTRATION. *(E.)*

Eisenberg, M. M. (Mount Sinai Hosp., Minneapolis, Minn.), K. Sugawara and R. C. Chawla. *Arch Surg* 100(2):195-200, 1970.

The motility response of the innervated antral pouch (before or after truncal vagotomy) to antral distention and to i.v. pentagastrin administration was characterized by a high frequency of contraction and low contraction pressure in dogs. The motility response of the vagally denervated antral pouch to antral distention and to i.v. pentagastrin administration was characterized by high contraction pressure and low frequency of contraction. The innervated antral pouch showed regular symmetrical contractions while the denervated pouch showed sporadic activity in the basal state. The disparity in motility response between denervated and innervated antral pouches may be due to transection of gastric muscle.

1646 MOBILIZATION OF CELLULAR CALCIUM FOR CONTRACTION IN INTESTINAL SMOOTH MUSCLE. *(E.)*

Hurwitz, L. (Sch. Med., Vanderbilt U., Nashville, Tennessee) and P. D. Joiner. *Amer J Physiol* 218(1):12-19, 1970.

Transient contraction occurred in isolated longitudinal muscle from guinea pig ileum following incubation in a calcium-rich medium (36 mM $CaCl_2$) for 2 hr and subsequent removal to calcium-free medium. The amplitude of contraction decreased with an increase in time of incubation thus indicating a reversed sigmoid curve. The amplitude of maximum contraction which the longitudinal fibers of the ileum would theoretically exhibit in the presence of an infinite quantity of stored muscle was smaller than that of a reference response elicited under control conditions. The addition of $1.4x10^{-6}$ M acetylcholine to the calcium-free medium increased the amplitude of maximum contraction but did not affect the rate at which calcium was lost to the external medium. The movement of calcium ions from a cellular depot to the region where they activate muscle contraction appears to be regulated by a saturable transport system and acetylcholine may increase the maximum turnover rate of this system.

1647 A METHOD FOR MEASURING TRANSMURAL ELECTRICAL POTENTIAL DIFFERENCE IN ILEUM AND COLON IN THE UNANESTHETIZED DOG. *(E.)*

Rij, A. M. (U. Otago Med. Sch., Dunedin, New Zealand), J. Riddle, M. G. Jamieson and A. M. Clarke. *Proc U Otago Med Sch* 47(3):80-81, 1969.

A technique for measurement of the transmural electrical potential difference in the ileum and in the colon of the unanesthetized dog is described. The luminal electrodes consist of 9 cm bags of cellulose dialysis tubing fixed over catheters and filled with the test solution and the reference electrode consists of a 12 in polyethylene catheter placed in the cephalic vein and perfused with a 0.89% NaCl solution at 20 ml/hr. Measurements were also made with a reference electrode placed in the peritoneal cavity. The recording electrodes were connected by a wide-base polyethylene tubing containing 0.89% NaCl and a 4% agar-3M KCl bridge, to standard calomel electrodes. There was no significant difference in the potential difference recordings obtained with the i.v. reference electrode and the peritoneal reference electrode. The mean potential difference in the ileum was -0.5 mV (range: -2.0 to +4.6 mV) and in the colon was -2.3 mV (range: -6.2 to 2.4 mV). There was a rhythmical variation in amplitude from 1.0 to 1.5 mV, and in frequency (1 cycle/2 to 4 min), which was more marked in the ileum.

1648 PROSTAGLANDIN INHIBITION OF INNERVATED ANTRAL MOTILITY IN DOGS. *(E.)*

Chawla, R. C. (U. Minnesota Sch. Med., Minneapolis). *Proc Soc Exp Biol Med* 132(3):1081-1086, 1969.

The effect of prostaglandin (PGE_1) on motility patterns of innervated gastric antral pouches (at dose levels previously established as having an inhibitory effect on gastric secretion) was studied in unanesthetized dogs. Both amplitude and frequency of contraction of antral pouches were decreased within 5 min after PGE_1 infusion (begun 20 min after i.v. injection of 2-deoxy-D-glucose) and motility was inhibited after 15 min (sustained) and 30 min (minimal). Amplitude of contraction was inhibited to a greater extent than the frequency of contraction by PGE_1. The increase in blood sugar levels produced by pretreatment with 2-deoxy-D-glucose was not affected by PGE_1 infusion.

649 THE EFFECT OF VAGOTOMY ON GALL BLADDER AND DUODENAL PRESSURES DURING REST AND STIMULATION WITH CHOLECYSTOKININ. *(E.)* Liedberg, G. (Dept. Surg., U. Lund, Sweden). *Acta Chir Scand* 135(8):695-700, 1969.

Gall bladder and duodenal pressures were examined in anesthetized cats before and after vagotomy, during rest and stimulation with cholecystokinin (<1U/kg). Resting pressure in the gall bladder was decreased by 0.3 to 1.5 mm Hg after vagotomy. The change in gall bladder pressure with cholecystokinin, before and after vagotomy, was inconsistent and ranged from -1.0 to +1.2. In the duodenum, resting activity and the response to cholecystokinin were temporarily decreased or abolished after vagotomy and when activity returned after 1 to 2 hr, it tended to be more intense than before vagotomy. To study the late effects of vagotomy on the maximal contractibility of the gall bladder, a supramaximal dose of cholecystokinin was given to a group of cats 2 to 3 weeks after total subdiaphragmatic vagotomy and extramucous pyloroplasty, and to another group of control cats. The maximal gall bladder pressure increase was 15.4±4.4 and 15.8±4.1 mm Hg for the control and vagotomized animals, resp.

1650 THE ACTION OF PENTAGASTRIN ON GASTRIC MOTILITY: ROENTGEN KYMOGRAPHIC STUDY. *(Ger.)* Szekely, A. (Tetenyi-ut Hosp., Budapest, Hungary), T. Major and H. Romvari. *Fortschr Roentgenstr* 111(6):841-846, 1969.

Roentgen kymography was performed in 24 patients with various intestinal and/or other diseases before and after pentagastrin, 6 mcg/kg i.m. In 75% of these cases, pentagastrin increased the rate and amplitude of antral peristalsis and caused a corresponding reduction in periodicity. Six control patients examined under similar conditions but without pentagastrin showed no change in antral peristalsis.

1651 SENSITIZATION OF THE ISOLATED INTESTINE OF THE RAT BY MEANS OF METABOLIC INHIBITORS TO SYMPATHOMIMETIC EFFECTS: CASE OF PHENYLEPHRINE AND ISOPRENALINE. *(Fr.)* Valette, G. (Fac. Pharm., Paris, France). *C R Acad Sci* 269(19):1893-1896, 1969.

1652 EFFECT OF CAPSAICIN ON THE ISOLATED ILEUM AND AURICLE OF THE GUINEA PIG. *(E.)* Molnar, J. (St. Inst. Occupational Hlth., Budapest, Hungary), L. Gyorgy, G. Unyi and J. Kenyeres. *Acta Physiol Acad Sci Hung* 35(3-4):369-374, 1969.

1653 NATURE OF THE PERISTALTIC BLOCK PRODUCED BY MAGNESIUM. *(E.)* Beleslin, D. B. (Lab. Neuropsychol., Purdue U., Lafayette, Indiana). *Nature* 225(5230):383-384, 1970.

1654 RISE IN INTRAGASTRIC PRESSURE CAUSED BY SUXAMETHONIUM FASCICULATIONS. *(E.)* LaCour, D. (U. Hosp., Aarhus, Denmark). *Acta Anaesth Scand* 13(4):255-261, 1969.

1655 ANALYSIS OF VARIOUS CHARACTERISTICS OF INTRINSIC INTESTINAL REFLEXES. *(Fr.)* Abbadessa, S. (Inst. Gen. Physiol., U. Palermo, Sicily), I. Di Gregorio and G. Gravante. *Arch Int Physiol* 77(4):787-796, 1969.

1656 A CLINICAL TEST OF A NEW ANTISPASMODIC DRUG IN THE TREATMENT OF BILIARY AND INTESTINAL DISEASES. *(Fr.)* Mainguet, P. (Brussels, Belgium). *Acta Gastroent Belg* 32(10):771-777, 1969.

1657 DORSAL NUCLEUS OF THE VAGUS AS A CENTER CONTROLLING GASTRIC MOTILITY IN SHEEP. *(E.)* Howard, B. R. (Dept. Physiol., U. Edinburgh, Scotland). *J Physiol* 206(1):167-180, 1970.

1658 PHARYNGOESOPHAGEAL MUSCLE ACTIVITY DURING SWALLOWING IN MAN. *(E.)* Shipp, T. (Speech Res. Lab., San Francisco, Calif.), W. W. Deatsch and K. Robertson. *Laryngoscope* 80(1):1-16, 1970.

1659 THE EFFECT OF METOCLOPRAMIDE ON THE MOTILITY OF THE GASTRO-INTESTINAL TRACT. (THE EFFECT OF METOCLOPRAMID ON THE ALKALI TEST ACCORDING TO NOELLER). *(Ger.)* Gloor, M. (Med. Clin., Stuttgart, Germany) and K. Heinkel. *Z Gastroent* 7(5):367-372, 1969.

1660 METOCLOPRAMIDE. A MOTILITY-ACCELERATING PREPARATION WITH ANTI-EMETIC EFFECT. *(Nor.)* Banke, L. (no affil). *Ugesk Laeg* 131(48):2075-2078, 1969.

1661 THE EFFECT OF METOCLOPRAMIDE ON THE MOBILITY OF THE STOMACH AND DUODENUM. *(Nor.)* Gravgaard, E. (no affil). *Ugesk Laeg* 131(48):2079-2081, 1969.

1662 TRANSMURAL ELECTRICAL POTENTIAL DIFFERENCE OF THE HUMAN COLON. *(E.)* Geall, M. G. (Mayo Grad. Sch. Med., U. Minnesota, Rochester), R. J. Spencer and S. F. Phillips. *Gut* 10(11):921-923, 1969.

1663 EFFECT OF FEEDING AND GASTRIN-LIKE TETRAPEPTIDE ON THE TRANSMURAL POTENTIAL DIFFERENCE AT SEVERAL PARTS OF THE CANINE STOMACH *IN SITU*. *(Jap.)* Kurohara, S. (Kumamoto U. Med. Sch., Japan) and S. Kitahara. *Med Biol* 79(6):223-225, 1969.

- P:Secr:Stom (1667)
- D:Esoph (1848)

1664 THE MORPHOLOGICAL AND FUNCTIONAL CONSEQUENCES OF EXPERIMENTAL SEGMENTAL MYECTOMY OF THE ESOPHAGUS. *(Ger.)* Kralik, J. (1st Surg. U. Clin., Olmutz, Czechoslovakia), K. Vojacek and G. Skibbe. *Langenbeck Arch Chir* 326(1):38-46, 1969.

1665 CEREBRAL BLOOD FLOW AND METABOLISM IN HEPATIC CIRRHOSIS BEFORE AND AFTER PORTACAVAL SHUNT OPERATION. *(E.)* Porro, G. B. (Inst. Med. Path., U. Milan, Italy), A. T. Maiolo and P. Della Porta. *Gut* 10(11):894-897, 1969.

1666 INHIBITION OF GASTRIC SECRETION BY BACTERIAL LIPOPOLYSACCHARIDE IN THE RAT.

(E.) Leenen, F. H. H. (Inst. Vetr. Pharmacol. Toxicol., U. Utrecht, Netherlands) and A. S. J. P. A. M. Van Miert. *Europ J Pharmacol* 8(2):228-231, 1969.

Escherichia coli lipopolysaccharide, 1 μg/kg i.v., inhibited the volume, pH, total acid output and acid concentration of the gastric juice in rats. The inhibitory effect of lipopolysaccharide was prevented by direct stimulation of gastric secretion with carbachol and by pretreatment with reserpine or inhibitors of catecholamine synthesis (α-methyldopa and diethyl dithiocarbamate) but not by adrenalectomy, by pretreatment with adrenergic blocking agents (dibenamine and propranolol), or by central parasympathetic stimulation by 2-deoxy-D-glucose.

1667 SELECTIVE AND TOTAL VAGOTOMY PLUS PYLOROPLASTY: A COMPARATIVE STUDY OF GASTRIC SECRETION AND MOTILITY IN DOGS.

(E.) Everett, M. T. (United Cardiff Hosp., Wales) and C. A. Griffith. *Ann Surg* 171(1):31-35, 1970.

The effects of total and selective vagotomy with pyloroplasty on gastric secretion and gastrointestinal motility were measured in four adult mongrel dogs with Heidenhain pouches. Selective vagotomy was performed at the gastric cardia with transection of the gastric vagi and preservation of the hepatic and celiac vagi, and without interference of the vagal trunks. Heidenhain pouch secretion with pyloroplasty was two times greater after total vagotomy than after selective vagotomy. There was no difference in gastrointestinal motility between the two groups. Hepatic and celiac vagi apparently inhibit gastric secretion, thus selective vagotomy may lower gastric secretion more effectively and provide better protection against recurrent ulcer than total vagotomy.

1668 GASTRIC SECRETION OF ACID AND INTRINSIC FACTOR IN PATIENTS WITH HYPER- AND HYPOTHYROIDISM.

(E.) Dotevall, G. (Sahlgren's Hosp., U. Goteborg, Sweden) and A. Walan. *Acta Med Scand* 186(6):529-533, 1969.

Gastric secretion of acid and intrinsic factor was examined basally and after histamine stimulation in 15 consecutive thyroid disease patients (10 with hyperthyroidism and 5 with hypothyroidism). Basal acid secretion was lowered in both hyper- and hypothyroid patients as compared with controls and histamine-stimulated acid secretion was significantly lowered in all the patients except 2 (with hyperthyroidism). Basal and histamine-stimulated secretion of intrinsic factor were each significantly depressed (1000 u/hr) in four hyperthyroid patients and 3 hypothyroid patients (there was one case of pernicious anemia and one of latent pernicious anemia among the 5 hypothyroid patients). The secretion of intrinsic factor correlates with acid secretion, which is in agreement with the clinical association between thyroid gland disease and pernicious anemia.

1669 SERUM GASTRIN CONCENTRATIONS IN PERNICIOUS ANEMIA.

(E.) McGuigan, J. E. (U. Florida Coll. Med., Gainesville) and W. L. Trudeau. *New Eng J Med* 282(7):358-361, 1970.

Serum gastrin concentrations were measured by radioimmunoassay in 29 patients with pernicious anemia and compared with a control population. Mean fasting serum gastrin levels were 997±182 pg/ml for 6 pernicious patients and 165±28 pg/ml for 102 controls and mean postprandial (1½ to 2 hr) serum gastrin concentrations for the 29 patients and 30 controls were 1007±303 and 209±55 pg/ml, resp. Four of the patients with pernicious anemia had serum gastrin concentrations over 2500 pg/ml. Mean fasting serum gastrin concentrations for control patients 20 to 39, 40 to 59, 60 to 79 and over 80 yr of age were 52, 118, 213 and 518 pg/ml, resp.

1670 COMPARISON BETWEEN THE EFFECT OF PENTAGASTRIN AND HISTAMINE ON GASTRIC ACID SECRETION.

(E.) Liavag, I. (Ulleval Hosp., Oslo, Norway). *Acta Chir Scand* 135(8):719-722, 1969.

The mean maximal and peak hourly gastric acid secretion in response to histamine acid phosphate (40 μg/kg, s.c.) and pentagastrin (6 μg/kg, i.m.) administration were determined in 21 patients with duodenal ulcer. The mean maximal acid output was 32.15±10.59 and 31.98±9.08 mEq/hr after pentagastrin and histamine administration, resp. Pentagastrin injection elicited the maximal acid secretory response after 15 to 30 min, following which secretion remained constant until the last 10 to 20 min of collection (the peak 20 min response was between 10 and 30 min after injection). With histamine, the peak 15 and 20 min periods of acid output were between 25 and 40 min and between 20 and 40 min, resp. After 30 min the histamine augmented acid secretion remained fairly constant until the last 20 min of collection. Side effects following pentagastrin were infrequent and mild. One patient had slight nausea and another had mild abdominal discomfort. Pentagastrin is as potent a stimulant of gastric acid secretion as histamine, and the pentagastrin test is simple, brief and lacks troublesome side effects.

1671 EFFECT OF GASTRIN ON THE *IN VIVO* INCORPORATION OF ^{14}C-LEUCINE INTO PROTEIN OF THE DIGESTIVE TRACT.

(E.) Johnson, L. R. (VA Ctr., Los Angeles, Calif.), D. Aures and R. Hakanson. *Proc Soc Exp Biol Med* 132(3):996-998, 1969.

Male and female rats injected with ^{14}C-leucine (2×10^7 cpm/kg) were given either human synthetic gastrin(20 μg/kg i.p.) or pentagastrin(250 μg/kg i.p.) or saline(control group) to determine whether gastrin can increase the *in vivo* incorporation of amino acids into protein. Protein was precipitated from oxyntic, antral and duodenal mucosa and from liver and skeletal muscle, and the incorporation of the radioactive amino acid was determined as an index of protein synthesis. Gastrin produced an 11 to 32% stimulation of protein synthesis in duodenal and gastric mucosa but had no effect on liver, and decreased the incorporation in skeletal muscle. These effects are qualitatively identical to those reported previously from an *in vitro* system. This evidence further supports the suggestion that gastrin may be a trophic hormone for parts of the digestive tract.

1672 EFFECTS OF SECRETORY INHIBITORS ON MUCOSAL BLOOD FLOW IN NONSECRETING STOMACH OF CONSCIOUS DOGS.

(E.) Cowley, D. J. (Mayo Clin., Rochester, Minn.) and C. F. Code. *Amer J Physiol* 218(1):270-274, 1970.

The aminopyrine-clearance procedure of Jacobson et al. was applied to resting mucosal conditions in an attempt to measure mucosal blood flow in the nonsecreting mucosa and to estimate the direction of changes induced by epinephrine, norepinephrine, vasopressin and a single rapid i.v. infusion of gastrin pentapeptide. Control values (designated as 100%) of plasma clearance of aminopyrine (20 mg/kg) were reproducible in four female mongrel dogs with Heidenhain pouches, and provided an index of resting, nonsecreting mucosal blood flow. I.V. injection of Pitressin (4 units/hr for 1.5 hr) reduced aminopyrine clearance by a mean value of 73%; norepinephrine (0.5 μg/kg/min for 1.5 hr) reduced aminopyrine clearance by 45%; and epinephrine (1.0 μg/kg/min for 1.5 hr) increased clearance in 4 dogs, with a range of +17% to +294% over control values, and a mean increase of +140%. Infusion of gastrin (50 μg) reduced aminopyrine clearance, with a maximum reduction of 47% occurring 45 min after infusion. In all cases, aminopyrine clearance returned to control levels within 90 min following infusions of these hormones.

1673 THE EFFECT OF VARIOUS TYPES OF MUSIC ON THE SECRETORY FUNCTION OF THE STOMACH.

(E.) Classen, M. (Med. Dept., Erlangen-Nuremberg U., Germany), L. Demling and M. Tzschoppe. *Amer J Dig Dis* 15(1):15-20, 1970.

The influence of various types of music ("pop" music, W. A. Mozart, and L. van Beethoven) on gastric acid secretion was investigated in 23 healthy subjects. Volume intensities were maintained at levels typical of concert hall performances. In most subjects, a significant reduction in gastric acid production occurred. This effect was independent of music preferance and the initial psychological conditon of the subject.

1674 BACKDIFFUSION OF H^+ DURING GASTRIC SECRETION.

(E.) Altamirano, M. (Med. Fac., Central U. Venezuela). *Amer. J. Physiol* 218(1):1-6, 1970.

Some characteristics of Na^+ and H^+ transport were studied in a semiisolated piece of the gastric corpus of anesthetized dogs. Hydrogen disappeared continuously from the resting stomach at a rate that was directly proportional to the acidity of the gastric contents. There was no relation between Na^+ inflow and H^+ outflow and the Na^+ inflow was reduced significantly when isotonic HCl was instilled in a resting stomach that contained previously distilled water or isotonic glucose (replacement of sucrose by HCl increased the inflow of Na^+). Stimulation with histamine (0.1 mg/kg s.c. every 30 min) eliminated the measurable H^+ loss and reduced the inflow of Na^+ by at least 50%. At least one-half of the Na^+ and all the H^+ outflow observed in the nonstimulated corpus seemingly takes place through the parietal and/or peptic cells and during secretion, the acidity of the gastric juice does not seem to be reduced by back diffusion of H^+.

1675 THE LOCATION OF THE CHEMORECEPTOR CONTROLLING GASTRIC ACID SECRETION DURING HYPOGLYCEMIA.

(E.) Colin-Jones, D. G. (U. Coll. Hosp. Med. Sch., London, England) and R. L. Himsworth. *J Physiol* 206(2):397-409, 1970.

Male Norwegian hooded rats were used in experiments designed to locate the position in the central nervous system of specific chemoreceptors, by measuring the rate of gastric acid secretion while producing a local inhibition of glucose metabolism within different parts of the brain by the injection of small amounts of 2-deoxy-D-glucose. These injections (directly into the lateral hypothalamic area, but not elsewhere) caused a prompt and sustained secretion of acid by the stomach at a rate comparable to that due to insulin hypoglycemia. The amount of 2-deoxy-D-glucose injected into the brain (0.25 mg) was less than 1% of the minimum dose which will produce the same effect when given i.v. Acid secretion following such injections, like that resulting from hypoglycemia, could be stopped by raising the plasma glucose concentration by the i.v. infusion of glucose. Unilateral intrahypothalamic injection of 2-deoxy-D-glucose activated both vagi. Cutting one vagus reduced the secretion but division of both was necessary to abolish secretion. Gastric acid secretion evoked by a systemic stimulus (insulin-induced hypoglycemia or i.v. 3-O-methylglucose) could be prevented by inactivating the lateral hypothalamic area on each side with phenol or lignocaine. These results indicate that there is a chemoreceptor, located in the lateral hypothalamic area, which responds to a lack of metabolizable glucose and which can initiate and sustain the vagally mediated secretion of acid by the stomach.

1676 FACTORS AFFECTING THE BIOASSAY OF GASTRIN IN THE ANESTHETIZED RAT.

(E.) Wilken, B. J. (U. Mississippi Med. Ctr., Jackson), W. A. Billups, D. G. Hunt, M. D. Turner and J. D. Hardy. *Arch Surg* 100(2):205-211, 1970.

1677 THE ACTION OF SOME AGENTS ACTIVE AT AUTONOMIC GANGLIONIC SITES ON THE SECRETORY RESPONSE OF THE HEIDENHAIN POUCH TO VARIOUS STIMULI.

(E.) Odori, Y. (Creighton U. Sch. Med., Omaha, Nebraska) and D. F. Magee. *Europ J Pharmacol* 8(2):221-227, 1969.

1678 VARIOUS METHODS FOR INVESTIGATING THE GASTRIC SECRETION IN DUODENAL ULCER PATIENTS. *(Fr.)* Pelikan, V. (3rd Med. Clin., Olomouc, Czechoslovakia), V. Horcicka and S. Komenda. *Acta Gastroent Belg* 32(10):707-718, 1969.

1679 A COMPARISON BETWEEN THE GASTRIC AND SALIVARY CONCENTRATION OF IODIDE, PERTECHNETATE, AND BROMIDE IN MAN. *(E.)* Harden, R. McG. (U. Dept. Med., Glasgow, Scotland), W. D. Alexander, J. Shimmins and D. Chisolm. *Gut* 10(11):928-930, 1969.

1680 PRIMARY SECRETIONS AND GASTRIC BUFFER DURING LOW DOSAGE HISTAMINIC TESTS IN NORMAL SUBJECTS AND IN PATIENTS WITH GASTRIC DISEASES. *(Fr.)* Ligny, G. (Civil Hosp., Charleroi, Belgium) and J. Manouiloff. *Acta Gastroent Belg* 32(10):697-706, 1969.

1681 THE POTENCY OF ANESTHETICS IN FROG GASTRIC SECRETION IN Cl^- SOLUTIONS. *(E.)* Blackburn, G. K. (Dept. Anesth., U. Louisville, Kentucky), W. Crenshaw, T. N. MacKrell and M. Schwartz. *Proc Soc Exp Biol Med* 132(3):1060-1063, 1969.

1682 SPONTANEOUS DECREASE IN GASTRIC SECRETORY RESPONSE TO HUMORAL STIMULI. *(E.)* Waterfall, W. (Roy. Infirm., Sheffield, England). *Brit Med J* (5681):459-461, 1969.

- P:Morph (1608)(1613)
- P:Absorp (1637)(1640)(1643)
- P:Motil (1644)(1645)(1648)(1650)(1657)(1663)
- D:Stomduo (1859)(1886)
- D:Stomduo:Peptulc (1903)

1683 EFFECTS OF ETHANOL, DL-ETHIONINE, AND PROTEIN DEFICIENCY ON RAT PANCREAS.

(E.) Pirola, R. C. (Roy. Free Hosp., London, England), K. B. Taylor, A. E. Davis and A. G. Liddelow. *Amer J Dig Dis* 15(1):21-30, 1970.

Male Wistar rats, given 15% ethanol for 70 days, showed a marked increase in pancreatic aminopeptidase activity, a slight increase in acid phosphatase activity, and no alteration in alkaline phosphatase, nonspecific esterase or succinic dehydrogenase activities. The histologic appearance of the pancreas in these rats was similar to that in pair-fed controls and included patchy parenchymal cell necrosis and inflammatory cell infiltration. Female rats, given 0.5% DL-ethionine for 5 to 20 days, showed an increase in pancreatic leucine aminopeptidase activity and histologic pancreatic changes characterized by marked necrosis and inflammation (after 20 days). Female rats, fed a diet containing 5% protein for 19 to 35 days, showed an increase in pancreatic leucine aminopeptidase activity but no abnormal histology of the pancreas. An increase in the activity of leucine aminopeptidase activity may be a factor in various forms of pancreatic injury.

1684 FINE STRUCTURE OF THE PANCREATIC ISLET CELLS OF NORMAL AND ALLOXAN TREATED BATS ("EPTESICUS FUSCUS").

(E.) Hinkley, R. E. (Dept. Physiol. Cell Biol., U. Kansas, Lawrence) and P. R. Burton. *Anat Rec* 166(1):67-86, 1970.

The pancreas of the large brown bat, *Eptesicus fascus*, was studied with respect to ultrastructure of islet cells and structural alterations induced 48 hr after i.p. injection with alloxan (125-50 mg/kg). The overall appearance of the islet cells was similar to that of other mammals, as was the ultrastructure of normal active and hibernating bat islet cells. In serial sections, B granules were disk-shaped and some B granules consisted of three component plates. Vesicular configurations formed in A and B cells suggested that the Golgi complex is essential to granule formation. Alloxan damage to B cells was dose-related and fairly constant in any one islet, but varied markedly between islets. The A cells were unaffected by alloxan. In bats receiving the 50 mg/kg dose of alloxan, damage to B cells ranged from a large increase in cytoplasmic vesicles to distension of the nuclear envelope with mitochondrial swelling and finally a disruption of all plasma membranes.

1685 DISTRIBUTION AND VOLUME OF THE ISLETS OF LANGERHANS IN THE CANINE PANCREAS.

(E.) Acosta, J. M. (Hosp. "M.M.M. Fernandez", Rosario, Santa Fe, Argentina), J. C. Buceta, J. E. Pons, L. E. P. De Figari, O. A. M. R. Galli, E. E. Weinschelbaum and J. C. Soloaga. *Acta Physiol Lat Amer* 19(3):175-180, 1969.

The distribution and volume of pancreatic islet tissue was studied histologically in 11 dogs. The number and size of islets increased gradually from head to tail with the largest number per surface unit (6.99) and the greatest size in the tail segment. The total volume of islet tissue was greatest in the tail (143.41 mm^3) and the difference between the tail versus the body and the tail plus body versus the head was statistically significant. The determination of islet tissue volume is probably a more reliable method than simple counting of islets per unit of surface area in the evaluation of potential for insulin secretion.

1686 THE SECRETION OF PANCREATIC JUICE IN RESPONSE TO STIMULATION OF THE VAGUS NERVES IN THE PIG.

(E.) Hickson, J. C. D. (Physiol. Lab. Cambridge, England). *J Physiol* 206(2):275-297, 1970.

Landrace pigs of either sex (aged 4 to 12 weeks) and dogs were used to determine any difference in pancreatic secretory response to stimulation of the vagus nerves. In the pig, stimulation of the vagus nerves caused a profuse flow of pancreatic juice with a high content of bicarbonate, and a secretion of digestive enzymes. Injected atropine failed to diminish the flow of bicarbonate-rich juice, but did inhibit the effect of stimulation on enzyme secretion. Intra-arterial injections of acetylcholine closely imitated the effects of nerve stimulation, but both the flow of juice and enzyme secretion were abolished together by atropine. Stimulation of the vagus nerves and injections of acetylcholine were effective after resection of the stomach and intestine, indicating that these stimuli can act directly on the pancreas (independently of the release of gastrointestinal hormones). In the dog, vagus nerve stimulation and acetylcholine injections acted predominantly on enzyme secretion and caused only a small flow of juice; atropine inhibited all these effects. The persistence of a profuse flow of pancreatic juice on stimulation of the vagus nerves after the injection of atropine in the pig is a unique effect. In the pig the vagus nerves contain efferent fibers which can exert a much wider control of the flow of pancreatic juice than has been found in other species. It appears that reflex control of pancreatic secretion may be a more prominent feature in the pig than in the dog (or cat).

1687 A SPECIFIC HISTOCHEMICAL METHOD FOR THE DEMONSTRATION OF THE ACTIVITY OF PANCREATIC LIPASE.

(E.) Darnton, S. J. (London Hosp. Med. Coll., England) and J. A. Barrowman. *Histochem J* 1(6):551-557, 1969.

Emulsified long-chain triglyceride, a specific substrate for pancreatic lipase, was used in a modification of the Gomori technique for the demonstration of lipase. A purified triglyceride emulsion was used as the enzyme substrate, with sodium taurocholate added to emulsify the lipid and to act as a lipase activator. The pancreas, testis, cardiac stomach and liver obtained from normal rats were tested. Following incubation of tissues in a medium of 10 uM/ml triglyceride and 4 uM/ml sodium taurocholate in 20 ml of 0.04 M tris-hydrochloric acid buffer (pH 7.3) for more than 60 min, a black brown precipitate, reflecting lipase activity, was discretely distributed in grain-like fashion in the cytoplasm of pancreatic acinar tissue but not in the other tissue tested. This method seems to be specific for the demonstration of pancreatic lipase.

1688 THE SECRETORY AND VASCULAR RESPONSE TO NERVOUS AND HORMONAL STIMULATION IN THE PANCREAS OF THE PIG. *(E.)* Hickson, J. C. D. (Physiol. Lab., Cambridge, England). *J Physiol* 206(2):299-322, 1970.

Pigs and dogs were used to determine why (in the pig) the effects of vagus nerve stimulation on pancreatic secretion and bicarbonate ions withstand the action of atropine (annulling the secretion of digestive enzymes and abolishing all the secretory effects of acetylcholine injections). Pig pancreas was much more sensitive to secretin than was the pancreas of the dog. The output of amylase in pig pancreatic juice was increased more readily by vagus nerve stimulation than by pancreozymin injections; the opposite effect was found in the dog. In both species atropine reduced the response to pancreozymin by only 20 to 25%, compared with 70 to 95% for vagal stimulation. Vagal stimulation caused an intense, well-maintained vasodilation in the pancreas, which appeared after a shorter latent period than the secretion and was not diminished by atropine. Pancreozymin caused a smaller increase, and secretin only a slight increase in pancreatic blood flow which was also resistant to atropine, but appeared at the same time as the enhanced flow of juice. Acetylcholine injections caused a vasodilation which preceded the secretion but was abolished by atropine. There is a possibility that the pancreas receives an atropine-resistant parasympathetic vasodilator nerve supply. The results provide no evidence that a substance with specific secretin-like properties might be released within the pancreas to act as a secondary transmitter for the effect of stimulation of the vagus nerves on the flow of pancreatic juice. Differences in the parasympathetic innervation of the exocrine cells of the pancreas between the pig and dog may underlie the observed differences in the secretory responses of the gland in these species.

1689 THE ROLE OF CYCLIC ADENOSINE-3', 5'-MONOPHOSPHATE (AMP) IN GASTROINTESTINAL SECRETION. *(E.)* Scratcherd, T. (no affil) and R. M. Case. *Gut* 10(11):957-961, 1969.

1690 STUDY OF THE EXOCRINE SECRETION OF THE PANCREAS. *(Sp.)* Galindo, F. (Gastroent. Hosp. Dr. B. Udaondo, Buenos Aires, Argentina). *Prensa Med Argent* 56(29):1416-1427, 1969.

1691 DELAY OF HORMONALLY INDUCED DIABETES BY AMINO-GLUTETHIMIDE AND METYRAPONE IN PARTIALLY PANCREATECTOMIZED RATS BEARING TRANSPLANTABLE PITUITARY TUMORS: CONCOMITANT FAILURE TO PREVENT SPLANCHNOMEGALY. *(E.)* Bates, R. W. (Natl. Inst. Arthritis Metabol. Dis., Natl. Inst. Hlth., Bethesda, Md.) and M. M. Garrison. *Endocrinology* 86(1):107-119, 1970.

1692 HORMONE REPLACEMENT AND THE HYPOGLYCEMIA OF COMBINED TOTAL PANCREATECTOMY AND PARTIAL HEPATECTOMY IN THE RAT. *(E.)* Taghizadeh, A. (U. Coll. Hosp. Med. Ctr., London, England) and P. M. Sutton. *Brit J Exp Path* 50(6):605-611, 1969.

1693 CORRELATION OF HISTOLOGICAL CHANGES PRODUCED IN THE GLAND DURING PANCREATIC STIMULATION WITH BLOOD ENZYME LEVELS. *(E.)* Ribera, M. T. (Hosp. Santa Cruz and San Pablo, Barcelona, Spain), J. Huguet, L. Gramatica and J. Mulet. *Rev Esp Fisiol* 25(4):245-248, 1969.

- P:Morph (1572)(1580)

1694 THE ENTEROHEPATIC CIRCULATION OF UREA NITROGEN. *(E.)* Jones, E. A. (Roy. Free Hosp., London, England), R. A. Smallwood, A. Craigie and V. M. Rosenoer. *Clin Sci* 37(3):825-836, 1969.

The sizes of body urea pools and rates of urea synthesis were measured by a kinetic technique, utilizing labeled urea, in control subjects and in patients with uremia or stagnant loop syndrome. All subjects were given standardized low protein diets. After reduction of the enteric bacterial flora by oral broad spectrum antibiotics, there was a marked diminution in the urea synthetic rate in all groups. This was not associated with an appreciable change in either the size of the urea pool or the blood urea concentration. In a normal subject the administration of ammonium bicarbonate orally was associated with an increase in the rate of incorporation of nitrogen into urea which was approximately equivalent to the rate of ingestion of nitrogen as ammonium bicarbonate. The endogenous catabolism of urea by enteric bacterial urease did not result in a net loss of urea from the body. There was an enterohepatic circulation of nitrogen derived from urea which constituted a delay pathway in the excretion of nitrogen and which was greater in the patients with uremia (4.6 and 5.3 mgN kg^{-1} hr^{-1}) and stagnant loop syndrome (7.4 and 8.4 mgN Kg^{-1} hr^{-1}) than in controls 1.2 and 2.2 mgN kg^{-1} hr^{-1}), probably because of the greater availability of substrate urea and an excess of bacterial urease, resp. The results are compatible with the hypothesis that the nitrogen of endogenous or orally administered urea can be utilized in protein synthesis in man.

1695 ENZYMES FOR THE FORMATION OF LECITHINS BY TRANSMETHYLATION IN THE LIVERS OF DEVELOPING RATS. *(E.)* Artom, C. (Bowman Gray Sch. Med., Wake Forest U., Winston-Salem, N. C.). *Proc Soc Exp Biol Med* 132(3):1025-1030, 1969.

The activities of enzymes involved in the transmethylating pathway for the formation of lecithins (phosphatidyl choline) were determined in liver homogenates of rats in various stages of development. During the last week of fetal life, the mean values for the methionine-activating enzyme activity (expressed as per 100 mg of protein) varied between 58 to 100% of the mean activity in livers of adult females (about 65% in fetuses at term). After a minimum at birth, enzyme activities increased slowly and progressively, reaching a peak in adult females. The enzyme activities (expressed as per gram of wet tissue) in fetal livers represent smaller fractions (27 to 41%) of the mean activity of the adult livers. Values for methyltransferase activity (whether expressed as per 100 mg of protein or per gram of wet tissue) were very low in fetal livers, increased rapidly after birth, and reached a peak level at about the eighth day of extrauterine life.

1696 INDEPENDENT VARIATION OF GLUCAGON AND EPINEPHRINE RESPONSIVE COMPONENTS OF HEPATIC ADENYL CYCLASE AS A FUNCTION OF AGE, SEX, AND STEROID HORMONES. *(E.)* Bitensky, M. W. (New York U. Med. Ctr., New York), V. Russell and M. Blanco. *Endocrinology* 86(1):154-159, 1970.

Independent variation of the activity of the glucagon and epinephrine responsive components of hepatic adenyl cyclase as a function of age, sex and steroid hormone levels were studied in weanling, young adult and old Sprague-Dawley rats. Both the glucagon and epinephrine responsive adenyl cyclase activities decreased with increasing age, regardless of sex. Responsive components were significantly more active in weanling rat than in the older rat and the activity of the epinephrine responsive component of hepatic adenyl cyclase was higher in the female than in the male at all ages. Old adult rats exhibited 60 to 75% of the glucagon responsive component seen in weanling rats of the same sex, although in the male there was a much more pronounced fall in the epinephrine responsive component than in the female. Meticortelone, testosterone and ACTH significantly decreased the epinephrine responsive component in both male and female weanling rats while progesterone had a less pronounced effect and diethylstilbestrol had no suppressive effect. Adrenalectomy and hypophysectomy significantly increased the epinephrine responsive component and slightly reduced the glucagon component. Castration did not significantly alter the epinephrine component. Data support the hypothesis that the 2 hormonally sensitive adenyl cyclase systems in the liver are independent and under separate genetic control.

1697 SPECIFICITY AND OTHER PROPERTIES OF LYSOSOMAL LIPASE OF RAT LIVER. *(E.)* Hayase, K. (Dept. Food Sci. Technol., U. California, Davis) and A. L. Tappel. *J Biol Chem* 245(1):169-175, 1970.

Enzymes in rat liver homogenate which hydrolyze glycerol esters of decanoic acid exhibit two different lipolytic activities, one with optimum activity at pH$_5$ to 5.2 and the other at pH 8.6 to 9.0. At the lower pH the activity is associated with lysosomes, and at the higher pH with microsomes. Glycerol tri-, 1,2-di-, and 1-monodecanoate are hydrolyzed by lysosomes in decreasing order of activity, and by microsomes in increasing order of activity. When soluble lysosomal lipase hydrolyzed glycerol trioleate-1-^{14}C, the percentage of radioactivity recovered in the products was as follows: oleic acid, 40%; glycerol 1,2-dioleate, 52%; glycerol 1,3-dioleate, 8%; and glycerol monooleate, 0%. By the simple procedure of suspending the whole lysosomes in 0.05 M sodium phosphate buffer (pH 6.8), 94-95% of the lipase activity was solubilized without loss of activity. Iodoacetate, p-chloromercuribenzoate, and Hg(NO$_3$)$_2$ strongly inhibited lysosomal activity. Lysosomes are capable of hydrolyzing partial as well as full acyl esters of glycerol.

698 EFFECT OF PHOSPHOLIPASE A ON CHOLESTEROL SOLUBILIZATION BY LECITHIN IN A BILE SALT SOLUTION. *(E.)* Neiderhiser, D. H. (VA Hosp., Cleveland, Ohio) and H. P. Roth. *Gastroenterology* 58(1):26-31, 1970.

The relative abilities of lecithin and lysolecithin to solubilize cholesterol and the effect of converting lecithin to lysolecithin on cholesterol solubilization were studied. Lecithin, added to a solution of 180 mM/liter of sodium taurocholate, solubilized 0.37 ± 0.01 mM of cholesterol/mM of added lecithin, whereas lysolecithin solubilized only 0.20 ± 0.01 mM of cholesterol/mM of added lysolecithin. No cholesterol precipitated when the lecithin in a bile salt solution saturated with cholesterol was converted to lysolecithin. Oleic acid solubilized 0.10 ± 0.01 mM of cholesterol/mM of added oleic acid. Equimolar combinations of lysolecithin and oleic acid added to taurocholate appeared to act synergistically to solubilize 0.37 ± 0.02 mM of cholesterol (the same quantity of cholesterol solubilized by lecithin). The apparent synergistic effect of lysolecithin-oleic acid mixture seemingly indicates that they participate in a mixed micellar complex with cholesterol and retain configuration in a complex similar to lecithin.

1699 IMPAIRMENT OF ALBUMIN SYNTHESIS IN CELL-FREE SYSTEMS FROM RAT LIVER. *(E.)* Maeno, H. (Biochem. Inst., U. Freiburg, Germany), G. Schreiber, K. Weigand, U. Weinssen and J. Zahringer. *FEBS Letters* 6(2):137-140, 1970.

The presence of radiochemically pure serum albumin and the ratio of albumin to total protein synthesis in rat liver microsome cell-free preparations were studied by centrifugation and gel electrophoresis. Microsomes were incubated with pH 5 fraction or cell sap (from either normal or regenerating rat liver), L-^{3}H-leucine, and an ATP generating system for 30 min at 37° C and serum albumin was isolated before and after incubation. The specific radioactivity of protein decreased continuously during purification (by precipitation with ammonium sulfate) and finally approached constancy. Despite a considerable increase in the radioactivity incorporated into total protein, there was no increase in the radioactivity of albumin after incubation. The ratio of incorporation of leucine into albumin to that into total protein ranged from 0.07% to 0.14% compared with 3.5% and 1.4% *in vivo* for normal and regenerating liver, respectively. Albumin synthesis appears to be absent or strongly impaired in liver cell-free systems.

1700 EVIDENCE FOR A TWO-POOL SYSTEM GOVERNING THE EXCRETION OF RADIOACTIVE URINARY ESTROGEN CONJUGATES DURING THE FIRST EIGHT HOURS FOLLOWING THE ADMINISTRATION OF ESTRONE-6,7-^{3}H TO MALE SUBJECTS: PROBABLE ROLE OF THE ENTEROHEPATIC CIRCULATION. *(E.)* Howard, C. M. (Emory U. Sch. Med., Atlanta, Ga.), H. Robinson, F. H. Schmidt, J. R. McCord and J. R. K. Preedy. *J Clin Endocr* 29(12):1618-1629, 1969.

The possible role of the enterohepatic circulation as an anatomic pool for estrogen distribution was studied following i.v. administration of estrone-6,7-^{3}H to 4 normal male subjects. Urine samples were analyzed sequentially (every hr for 8 hr) for radioactive unconjugated estrone and for radioactive sulfates and glucosiduronates of estrone, estradiol-17β and estriol. The excretion of each estrogen was plotted against time and the resulting curves were fitted using a mathematical model consisting of either 1 or the sum of 2 gamma density functions. The urinary excretion of radioactive estrone glucosiduronate was 10 times greater than that of radioactive glucosiduronates of estriol and estradiol-17β. Unconjugated estrone (which does not enter the enterohepatic circulation) was excreted in the urine in the form of 1 gamma density function (suggesting one pool of distribution). Sulfates and glucosiduronates of estrone, estradiol-17β and estriol (which do enter the enterohepatic circulation) were excreted in the urine in the form of the sum of 2 gamma density functions (suggesting an additional pool of distribution for these conjugates).

1701 LACK OF EVIDENCE FOR A HEPATIC OSMORECEPTOR MECHANISM IN CONSCIOUS DOGS. *(E.)* Schneider, E. G. (U. Missouri Sch. Med., Columbia), J. O. Davis, C. A. Robb, J. S. Baumber, J. A. Johnson and F. S. Wright. *Amer J. Physiol* 218(1):42-45, 1970.

Urine flow, sodium excretion and urine osmolality were measured after infusion of sterile distilled water (0.25 ml/min/kg, 0.50 ml/min/kg, or 0.70 ml/min/kg) into either the portal vein or vena cava in dogs with chronic indwelling catheters in order to study the possible role of the liver in osmoregulation. Urine flow and free water clearance were increased, urine osmolality was decreased, and osmolal clearance was unchanged after infusion of 0.50 ml/min/kg or 0.70 ml/min/kg (in water dehydrated dogs) into either the portal vein or inferior vena cava (results were similar with either route of administration). In order to selectively stimulate the portal system without affecting the osmotic environment of the hypothalamus, distilled water (0.5 ml/min/kg was infused into the portal vein and, simultaneously, 5% sodium chloride (0.11 ml/min/kg) was infused into the inferior vena cava (infusions were reversed in a second experiment). Urine flow, sodium excretion and osmolal clearance were increased and urine osmolality and free water clearance were decreased following the infusion into either the portal vein or inferior vena cava. There was no significant difference in the results when 5% sodium chloride was infused into the portal vein or inferior vena cava. Data do not provide evidence for an osmoreceptor mechanism in the liver of dogs.

1702 RELEASE OF COPPER BY RAT LIVER. *(E.)* Owen, C. A. (Mayo Clin., Rochester, Minn.) and A. L. Orvis. *Amer J Physiol* 218(1):88-91, 1970.

The release of free and ceruloplasmin-bound ^{64}Cu was measured in isolated, perfused (with nonradioactive blood) liver of rats who had been given i.v. doses (5-338 μg) of ^{64}Cu-labeled copper from 15 min to 24 hr prior to hepatectomy. The release of free ^{64}Cu was consistently greater than that of ceruloplasmin-bound ^{64}Cu, especially during the first hr of perfusion. The excretion of ^{64}Cu into the bile and its eventual recirculation in the blood were decreased and hepatic retention of ^{64}Cu was increased in perfused livers from rats in which the interval between the dose of ^{64}Cu and hepatectomy was increased. A rapid equilibrium between ^{64}Cu and ^{67}Cu (based on the ratio of isotopes in the bile and plasma ceruloplasmin) occurred in rat liver which had been prelabeled with ^{67}Cu and perfused with ^{64}Cu-labeled blood. Rats were exsanguinated 20 hr after they had received ^{64}Cu and their liver was perfused for 5 hr with the pooled blood. The amount of ^{64}Cu-labeled ceruloplasmin was increased and plasma ^{64}Cu not bound to ceruloplasmin was decreased. A copper-storage compartment with a bidirectional flux of copper appears to exist within rat liver.

1703 SHIFT OF LIVER ALDOLASE TOWARDS THE MUSCLE TYPE IN HEPATOMA: IMMUNOLOGICAL STUDY.

(E.) Nordmann, Y. (Inst. Molec. Path., U. Paris, France). *Europ J Cancer* 5(5):485-489, 1969.

The similarity of muscle-type aldolase and liver-type aldolase was investigated in rat hepatoma and in fetal liver, using the antibodies (prepared in chickens) for crystalline rabbit liver and muscle aldolase. Aldolase activity was measured by calorimetric methods and protein content was measured by comparing the removal of neutralizing antibodies by hepatoma and fetal liver extracts with that by adult liver. Standard curves were obtained by adding increasing amounts of liver extract to a constant amount of antiserum to rabbit liver aldolase or to antiserum to rabbit muscle aldolase. Following incubation and centrifugation, the supernatants were assayed for antibodies and the experiments were then repeated on hepatoma and on fetal liver. There was a direct inhibition of aldolase activity of rat hepatoma or fetal liver by antiserum. There was a greater inhibition of rabbit muscle aldolase in hepatoma and in fetal liver than in normal liver, and the reverse was true with respect to inhibition by rabbit liver aldolase. In both hepatoma and in fetal liver, the relative amount of liver-type aldolase is one-sixth to one-third lower than in normal liver and muscle-type aldolase is from 1.7 to 17 times higher in hepatoma than in normal liver.

1704 SERINE METABOLISM AFTER PORTACAVAL SHUNT.

(E.) Reichle, F. A. (Temple U. Hlth Sci. Ctr., Philadelphia, Pa.), M. P. Brigham, R. R. Tyson, R. M. Reichle, M. Reilly and G. P. Rosemond. *Arch Surg* 100(2):163-166, 1970.

The effects of end-to-side portacaval shunts on various aspects of serine metabolism were studied in male Holtzman rats. Significant ($P=<0.001$) increases in hepatic serine dehydratase activity were noted postoperatively, as compared to sham operated or control rats, when the enzyme activity was expressed per gm wet liver, per total liver, or per mg of protein or DNA. Total hepatic serine dehydrogenase significantly increased in the livers of the animals with portacaval shunts despite significant liver atrophy. Postoperative serum levels of serine were lower in the rats with portacaval shunts than in sham operated rats. The metabolic changes suggest diffuse alteration in serine metabolism and increased conversion of the serine into the tricarboxylic acid cycle. The alterations in serine metabolism are also consistent with decreased intrahepatic choline formation.

1705 ACTIVATION OF LIVER PYRUVATE KINASE BY FRUCTOSE-1-PHOSPHATE.

(E.) Eggleston, L. V. (Nuffield Dept. Clin. Med., Oxford, England) and H. F. Woods. *FEBS Letters* 6(1):43-45, 1970.

Activation of pyruvate kinase by various hexose phosphates was studied in rat liver homogenates during perfusion experiments. At high concentrations (2.5 mM and above) all hexose phosphates including fructose-1,6-diphosphate, fructose-1-phosphate, fructose-6-phosphate, glucose-1-phosphate, glucose-6-phosphate and phosphoenolpyruvate activated pyruvate kinase, but at concentrations of 10 mM, only fructose-1,6-diphosphate and fructose-1-phosphate were effective. Activation of pyruvate kinase by fructose-1-phosphate was greatest at phosphoenolpyruvate concentrations of 0.05-0.25 mM, while at higher phosphoenolpyruvate concentrations (0.8 mM) activation by fructose-1-phosphate does not occur. With low phosphoenolpyruvate concentrations and no hexose phosphate addition, the rate of reaction decreased with time. The decline in reaction rate with fructose-1-phosphate and fructose-1,6-diphosphate was slight because hexose phosphate overcame the inhibition of pyruvate kinase by ATP. Activation of pyruvate kinase by fructose-1-phosphate may be essential for maximal rates of fructolysis in rat liver.

1706 CONVERTING ENZYME ACTIVITY IN EXPERIMENTAL CIRRHOSIS OF THE RAT.

(E.) Dauda, Gy. (U. Med. Sch., Debrecen, Hungary), I. Devenyi and V. Szokoly. *Acta Physiol Acad Sci Hung* 35(3-4): 365-368, 1969.

Renin and angiotensin, prepared from the blood of CCl_4-treated cirrhotic rats, were incubated in the presence of renin substrate derived from cirrhotic rats, and the reaction product was bioassayed in cirrhotic rats to determine if liver cirrhosis was associated with converting enzyme deficiency. Angiotensin II was demonstrated in both normal and cirrhotic rats and the pressor effect was 41% lower in cirrhotic than in normal rats. The amount of angiotensin II per ml of plasma in cirrhotic rats was 40.0 and 36.8 mg, and the assay performed in normal rats yielded values of 68.0 and 64.0 mg. The lower pressor response in cirrhotic animals was due to an increased angiotensinase level. Converting enzyme is neither absent nor inhibited in liver cirrhosis.

707 THE EFFECT OF HALOTHANE ON ELECTRON TRANSPORT, OXIDATIVE PHOSPHORYLATION, AND
WELLING IN RAT LIVER MITOCHONDRIA. *(E.)* Miller,
. N. (Washington U. Sch. Med., St. Louis, Mo.) and
. E. Hunter, Jr. *Molec Pharmacol* 6(1):67-77, 1970.

our distinct concentration-dependent effects were
oted on isolated liver mitochondria from Sprague-
awley rats (Holtzman). At halothane concentra-
ions of 0.5 to 2.0%, in the presence of NAD$^+$-
ependent substrate, oxygen uptake was inhibited
with maximal inhibition of 80%) and this effect
in the region of NADH dehydrogenase) had rapid
nset and rapid reversibility (less than 5 min).
ith succinate as substrate, oxygen uptake was not
ltered in this concentration range but there was
mall but distinct increase in respiration, and a
ignificant inhibition of the rate of phosphate-
nduced swelling thus suggesting a limited uncoup-
ing by halothane in the concentration range of
.5 to 2.0%. At concentrations of 3 to 4%, the
egree of this uncoupling appeared to be greater.
ith 3 to 4% halothane, there was partial inhibi-
ion of succinate oxidation, but no increase in
AD$^+$-dependent oxidation over that seen with 2%
alothane and most of the inhibition of succinate
xidation appeared to be direct, because normal
xidation was not restored by the addition of 2,4-
initrophenol and other uncoupling agents. High
oncentrations of halothane (5 to 10%) altered
embrane permeability and produced a concentration-
ependent, energy-independent swelling of mitochon-
ria suspended in 0.33 M sucrose-25 mM Tris buffer.

708 RELATION OF POLYSOME STRUCTURE TO RIBONUCLEASE INHIBITOR ACTIVITIES IN LIVERS
F MAGNESIUM-DEFICIENT GUINEA PIGS. *(E.)* Grace,
. D. (Dept. Agric. Chem., U. Missouri, Columbia)
nd B. L. O'Dell. *Canad J Biochem* 48(1):21-26,
970.

he effect of a magnesium deficient diet on the
olysome structure and the activities of ribonu-
clease and ribonuclease inhibitor in mammalian
iver was studied in weanling guinea pigs. The
control diet consisted of 0.3% Mg added as magne-
sium oxide and the two deficient diets contained
.002% and 0.012% Mg. Hepatic polysomes isolated from magnesium-deficient guinea pigs did not contain the 131 S ribosomal unit present in the polysomes of control animals and a 64 S particle not present in the controls appeared in the magnesium-deficient polysomes. Restriction of the control diet to quantity consumed did not affect the polysome pattern, but a restriction to maintain the same body weight caused a dissociation similar to that of magnesium deficiency. Alkaline ribonuclease activity and acid ribonuclease activity were higher in the livers of magnesium-deficient animals than in those of control animals. Dietary treatment had no significant effect on the concentration of ribonuclease inhibitor in the liver. The effect of dietary magnesium deficiency in decreasing the liver polysome stability is indirect and may be induced by severely reducing food intake.

1709 EXPERIMENTAL STUDY ON THE INFLUENCE OF DILUTED EXTRACORPOREAL CIRCULATION ON THE LIVER. *(E.)* Nozawa, F. (Kumamoto U. Med. Sch., Japan). *J Kumamoto Med Soc* 43(10):819-850, 1969.

Extracorporeal circulation was performed in dogs, using an artificial heart-lung preparation with a bubble type oxygenator to study the changes in the circulation dynamics and histology of the liver. Changes in liver phosphorylase, succinic dehydrogenase, lactic dehydrogenase and glycogen were measured to establish a standard procedure for blood dilution at the cellular level. Filling with whole blood caused pooling in the portal system leading to congestion and swelling of the liver, which increased with degree of dilution of extracorporeal perfusion solution regardless of perfusion rate. Phosphorylase activity is intensified upon filling with whole blood with shifting of activity from the central to the peripheral zone. Dilutions with low molecular weight dextran reversed this tendency to a normal state. Dilutions of extracorporeal perfusion solutions with low molecular weight dextran increased glycogen, succinic dehydrogenase activity, and lactic dehydrogenase activity. Diluted extracorporeal perfusion solution probably can be used for the improvement of blood circulation, rather than the curtailment of the amount of blood used.

1710 ROLE OF CYLIC ADENOSINE 3',5'-MONOSPHOSPHATE IN THE INDUCTION OF HEPATIC ENZYMES: I. KINETICS OF THE INDUCTION OF RAT LIVER SERINE DEHYDRATASE BY CYCLIC ADENOSINE 3',5'-MONOPHOSPHATE. *(E.)* Jost, J. P. (U. Colorado Sch. Med., Denver), A. Hsie, S. D. Hughes and L. Ryan. *J Biol Chem* 245(2):351-357, 1970.

Male Wistar rats were used to study the induction of rat liver serine dehydratase by cyclic AMP. The dehydratase formation was induced by cyclic 3',5'-AMP and not by other cyclic nucleotides or adenosine monophosphates. A single injection of cyclic 3',5'-AMP (or its dibutyryl derivative) increased the rate of incorporation of ^{3}H-leucine into serine dehydratase. Under the same experimental conditions the rate of synthesis of serum albumin did not change. A single i.p. injection of glucagon or oral intubation of a mixture of amino acids produced within 20 min, a 40-fold and 19-fold increase, respectively, in the concentration of cyclic 3',5'-AMP. The concentration of this nucleotide dropped to the original level within 1 hr after the beginning of the inducer administration. The induction of serine dehydratase by N^6,O$^{2'}$-dibutyryl cyclic 3',5'-AMP was fully inhibited by actinomycin D only if the drug was injected 15 to 30 min prior to the injection of the cyclic nucleotide. The uptake of ^{3}H-dibutyryl cyclic 3',5'-AMP by the liver was not inhibited by actinomycin D. Results were consistent with the hypothesis that cyclic AMP directly mediates the induction of serine dehydratase by glucagon and possibly by amino acids, and that cyclic AMP acts either on transcription or the transmission of the message from the nucleus, or both.

1711 *IN VITRO* EFFECTS OF HETEROLOGOUS ANTIBODIES ON THE METABOLISM AND FINE STRUCTURE OF YOSHIDA ASCITES HEPATOMA CELLS. *(E.)*

Marsilii, G. (Inst. Path. Gen., U. Firenze, Italy) and V. Chiarugi. *Sperimentale* 118(6):423-437, 1968.

Yoshida ascites hepatoma cells (AH 130) were maintained by i.p. injection in tumor-adapted Wistar rats for use in this *in vitro* study of the effects of heterologous specific antibodies on respiration, glycolysis and protein synthesis. Antibodies were always tested in the absence of complement. Large amounts of antihepatoma rabbit serum IgG immunoglobulins very mildly inhibit respiration but not glycolysis, of the ascites cells. In the same cells the antibodies strongly depress incorporation of glycine-1-^{14}C into proteins (either aerobically in the absence or presence of glucose, or anaerobically with glucose). The inhibitory effect on protein synthesis was also observed using a cell-free system from the same tumor cells. This inhibition in cell-free systems was more pronounced when using heterologous antibodies. Ferritin-labeled antibodies were detected mainly at the level of endoplasmic reticulum on the ribosomes. Electron microscope observations show that normal immunoglobulins are mainly segregated in the endoplasmic reticulum and preserve the cell structures during incubation. On the contrary, if the incubation medium contains antihepatoma immunoglobulins, ascites cells undergo several changes which may be related to the action of antibodies specific to structural antigens.

1712 DEGRADATION OF NUCLEIC ACIDS BY LYSOSOMAL EXTRACTS OF RAT LIVER AND EHRLICH ASCITES TUMOR CELLS. *(E.)*

Arsenis, C. (U. Illinois Coll. Med., Chicago), J. S. Gordon and O. Touster. *J Biol Chem* 245(1):205-211, 1970.

Purified Wistar rat (150 to 250 g) liver and Ehrlich ascites tumor lysosomes were examined for their ability to degrade nucleic acids from different sources. Extracts of rat liver tritosomes and of tumor cell mitochondrial plus lysosomal fractions were incubated with various types of DNA and RNA from sources ranging from bacteria to mammals. The extracts were able to hydrolyze all the nucleic acids completely to free nucleosides and inorganic phosphate. The degree of hydrolysis was maximal at about pH 4.5 (as measured by acid-soluble base release) with calf thymus DNA as substrate, and at pH 5.5 with soluble RNA as substrate. The release of phosphate from RNA was considerably slower than that from DNA. A ratio of substrate to enzyme protein higher than 32 gave complete hydrolysis of all the nucleic acids used as substrates. In comparison with the lysosomal enzyme systems responsible for the hydrolysis of other cellular constituents, it appears that the nuclease systems have similar stability and may be even more active. Liposomal extracts appear to have the ability to degrade nucleic acids from different sources.

1713 THE EFFECT OF INHIBITORS ON THE FORMATION OF PHOSPHOENOLPYRUVATE BY RAT LIVER MITOCHONDRIA. *(E.)*

Bartley, W. (Dept. Biochem., U. Sheffield, England) and B. Dean. *Biochem J* 115(5):903-912, 1969.

The effects of inhibitors on the formation of phosphoenolpyruvate (PEP) in isolated rat hepatocyte mitochondria was studied by incubating mitochondrial suspensions with various substrates. No dependence on exogenous ATP for PEP formation was observed. The maximum rate of PEP production from malate was at a concentration of 1 mM but pyruvate production increased up to 2.5 mM of malate, and thereafter increased slowly without reaching a maximum. Formation of PEP was inhibited by arsenate and arsenite with the latter causing pyruvate accumulation. The addition of oligomycin with 2,4-dinitrophenol, trethyltin, dicoumarol, thyroxin, GTP or ITP had no effect on PEP formation. The effect of inhibitors on PEP formation from malate and on their effects on the assayed activity of PEP carboxykinase were not parallel. Neither the GTP nor the PEP carboxykinase content of mitochondria could account for the PEP production from malate. Consideration of the kinetic characteristics of PEP carboxykinase and mitochondrial content of oxaloacetate and GTP show that this enzyme cannot account for the PEP formed from malate by mitochondria.

1714 THE SYNTHESIS OF SULFATED MUCOPOLYSACCHARIDE IN MOUSE LIVER FOLLOWING CARBON TETRACHLORIDE INJURY: I. AUTORADIOGRAPHIC STUDIES. *(E.)*

McGee, J. O'D. (Glasgow Roy. Infirm., Scotland) and R. S. Patrick. *Brit J Exp Path* 50(6): 521-526, 1969.

Autoradiographs of mouse liver taken 4 hr after i.p. administration of ^{35}S-sodium sulfate showed some concentration of radioactivity in the hepatic sinusoidal walls and in the coats of the portal and hepatic veins. Autoradiographs taken 28 and 52 hr after CCl_4 poisoning and 4 hr after ^{35}S-sulfate administration showed prominent exaggeration of the sinusoidal cell labeling in the necrotic zones, at the periphery of the liver lobules and in extracellular necrotic spaces. Radioactivity in centrilobular necrotic zones was diffuse (maximum 4 days after poisoning) and gave a positive reaction for mucopolysaccharide with alcian blue, colloidal iron and toluidine blue. During the stage of recovery from CCl_4 poisoning, condensation of ^{35}S-sulfate occurred over prominent reticulin fibers in the centrilobular zones. Liver sinusoidal cells apparently have a capacity for mucopolysaccharide synthesis which is exaggerated after hepatocyte injury.

1715 THE SYNTHESIS OF SULFATED MUCOPOLYSACCHARIDE IN MOUSE LIVER FOLLOWING CARBON TETRACHLORIDE INJURY: II. QUANTITATION AND PARTIAL CHARACTERIZATION OF EXTRACTED MUCOPOLYSACCHARIDE. *(E.)*

McGee, J. O'D. (Glasgow Roy. Infirm., Scotland) and R. S. Patrick. *Brit J Exp Path* 50(6): 527-532, 1969.

The synthesis of sulfated mucopolysaccharide (as measured by incorporation of ^{35}S-sodium sulfate into hepatic mucopolysaccharide fractions) in livers of normal mice and mice with CCl$_4$-induced injury was studied by chromatography and degradation procedures. Incorporation of ^{35}S-sulfate into hepatic mucopolysaccharide which occurs in normal mice was greatly exaggerated 2-3 days after acute liver injury in CCl$_4$. Chromatographic analysis and hyaluronidase digestion and nitrous acid degradation revealed that the hepatic mucopolysaccharide fraction consisted mainly of chondroitin sulfate A and/or C and heparan sulfate (there was no evidence for dermatan sulfate or keratan sulfate). Glucosamine and galactosamine were found in acid hydrolysates of the hepatic mucopolysaccharide fraction.

1716 FATTY ACID SYNTHESIS IN DEVELOPING MOUSE LIVER. *(E.)* Smith, S. (Child. Hosp. Med. Ctr. North. California, Oakland) and S. Abraham. *Arch Biochem B Biophys* 136(1):112-121, 1970.

Fatty acid synthesis in developing mouse liver was studied by measuring the incorporation of ^{14}C-labeled acetate and pyruvate into fatty acids (hepatic lipogenic capacity) by tissue slices together with the activities of enzymes involved in lipogenesis (acetyl CoA carboxylase, fatty acid synthetase, malic enzyme, glucose 6-phosphate dehydrogenase). Hepatic lipogenic capacity (normally low in suckling mice) and the activities of enzymes involved in lipogenesis were prematurely increased by weaning on a fat-free diet from day 16 of postpartum onward. Hepatic lipogenic capacity was greater in suckling mice ingesting linoleate-deficient milk than in those ingesting linoleate-rich milk during days 6 to 15 postpartum. Inhibition of RNA and protein synthesis (by pretreatment with actinomycin D and puromycin) abolished the increase in hepatic lipogenic capacity and the increase in lipogenesis enzyme activities associated with weaning.

1717 TRANSPORT AND BINDING OF CHLOROGUANIDE-TRIAZINE BY RAT LIVER SLICES. *(E.)* Gigon, P. L. (Sch. Pharm., Berne, Switzerland), P. K. Nayak and L. S. Schanker. *Proc Soc Exp Biol Med* 132(3): 1103-1109, 1969.

The transport and binding of chloroguanide-triazine (CGT) by the liver was studied by incubating rat liver slices in various concentrations of radioactive CGT alone or in combination with other compounds. When rat liver slices were incubated anerobically at 37° with 3.5×10^{-7}M CGT, the compound readily entered the tissue against an apparent concentration gradient. Uptake of CGT occurred by a process that became saturated at high concentrations of the drug. CGT uptake was dependent on cell metabolism: it was diminished by incubation in a dinitrophenol, iodoacetate or a nitrogen atmosphere, as well as by incubation in procaine amide, quinine, oxyphenonium and procaine amide ethobromide. p-Acetylaminohippuric acid and probenecid had no effect on hepatic uptake of CGT. The data suggest that CGT is taken up by liver slices partly by an active transport process that is closely related to the process of CGT secretion into bile, and partly by diffusion. CGT was highly bound to liver homogenates, suggesting that part of the accumulation in liver slices results from binding to tissue components.

1718 INCREASED INCORPORATION OF ^{3}H-THYMIDINE INTO RAT LIVER DNA AFTER HANDLING OF LIVER LOBES. *(E.)* Weinbren, K. (U. Nottingham Med. Sch., England), G. M. Arden and G. A. Stirling. *Brit J Exp Path* 50(6):540-547, 1969.

The effect of handling the anterior lobes of the liver without resection or disruption of the vascular supply was determined in 90 male albino rats given ^{3}H-thymidine (0.5 μC/g body weight) either i.p. or i.v., 1 hr before being sacrificed (6 hr to 10 days postoperatively). Handling of the liver was associated with an increased rate of incorporation of ^{3}H-thymidine into DNA. The response curve was distinctive and different in shape and in magnitude from that which occurs after partial hepatectomy. Incorporation was greater in peripheral parts of the liver, more striking after i.p. than i.v. administration of the isotope and was associated with a proliferation of hepatic capsular cells. Radioautographs showed activity in capsular cells, inflammatory cells and also in a few peripherally placed hepatocytes.

1719 ROLE OF SUBSTRATE IN THE REGULATION OF HEPATIC GLUCONEOGENESIS IN FASTING MAN. *(E.)* Felig, P. (Joslin Diabetes Found., Boston, Mass.), E. Marliss, O. E. Owen and G. F. Cahill, Jr. *Advances Enzym Regulat* 7:41-46, 1969.

The role of substrate in the regulation of hepatic gluconeogenesis was determined following the administration of amino acids to four obese patients who were fasted for two periods of 21 to 24 days each. Before commencement of each starvation period (and after an overnight fast) and again at the end of the fast, 10 g of alanine or glycine were infused (over 4 to 5 min) into an antecubital vein and blood samples were drawn from the opposite antecubital vein during a 30 min pre-infusion control period and at 10 to 30 min intervals for 3 hr following infusion. In the starved patients, following alanine infusion, there was a prompt hyperglycemic response, with a mean maximal increase in blood glucose of 14mg% (this represented an estimated 40% efficiency in alanine conversion to glucose). A similar increment was neither demonstrable in the fed state nor in patients (fed or fasted) given glycine. The provision of precursor substrate appears to be the rate limiting step in the control of hepatic gluconeogenesis in man during prolonged starvation.

1720 INVESTIGATIONS ON METABOLITES OF VITAMIN D IN RAT BILE. SEPARATION AND PARTIAL IDENTIFICATION OF A MAJOR METABOLITE. *(E.)* Bell, P. A. (Dunn Nutrit. Lab., U. Cambridge, England) and E. Kodicek. *Biochem J* 115(4):663-669, 1969.

Young male and female rats were studied to confirm the biliary route as the main excretory pathway for Vitamin D, and to attempt some separation and characterization of the metabolites in bile. The rats were given albumin-bound [1α-^{3}H] cholecalciferol (0.34 mg) and albumin-bound [^{14}C] ergocalciferol (0.54 mg), by continuous i.v. infusion over an 18 hr period. Bile was collected for 24 hr (from the beginning of infusion) from the cannulated bile ducts of both animals. Thirty-one percent of the radioactivity was recovered in the bile of the rat given [1α-^{3}H] cholecalciferol. Separation of the metabolites by gradient-elution column chromatography on silicic acid disclosed 5 metabolites, all more polar than 25-hydroxycholecalciferol or cholecalciferol. Vitamin D ester, Previtamin D and vitamin D were absent on the chromatogram. The major component was eluted with methanol and accounted for 34% of the recovered radioactivity. The rat infused with ergocalciferol developed obstructive jaundice, but column chromatography of the bile extract containing the recovered radioactivity (12.8%) gave a pattern identical with that of [1α-^{3}H] cholecalciferol. Anion-exchange resin chromatography showed that the 3 most polar metabolites of [1α-^{3}H] cholecalciferol, including the major metabolite, were ionic. The chromatographic mobility of the major metabolite was increased by methylation, acetylation, acid hydrolysis and treatment with glycol-splitting agents. The component was further identified as a glucuronide conjugate, which was not identical with synthetic cholecalciferol glucuronide.

1721 THE RESPIRATION OF HEPATIC SECTIONS OF RABBITS *IN VITRO* AFTER PARTIAL LIGATION OF THE PORTAL VEIN *IN VIVO*. *(Ger.)* Matzander, U. (Surg. Clin., U. Saarlandes, Hamburg, Germany), J. Dittmann and H. Schondorf. *Z Gastroent* 7(5):378-383, 1969.

The extent to which the deviation of portal blood supply in portocaval shunt interferes with the energy supply of hepatic cells was investigated in rabbits in which oxygen consumption of hepatic tissue under normal conditions of unrestricted blood flow and after portal ligation was compared by the single vessel manometric method of Warburg. A statistically significant reduction in oxygen consumption occurred in liver cells from those rabbits in which portal circulation had been interrupted (at normal body temperature this decrease amounted to 28%) and in liver tissue from rabbits in which portal ligation and measurements were performed under conditions of hypothermia. Reduction in hepatic blood supply after portocaval shunt for treatment of portal hypertension in cirrhotic patients is indicative of measures to correct the oxygen deficit and this may be obtained by subsequent arterialization of the liver, taking care not to increase the pressure in the liver capillaries (by using an afferent vessel for intrahepatic arterialization which has a smaller diameter than the portal vein). An autologous vascular transplant of the great saphenous vein between the arteria iliaca communis and the central stump of the portal vein meets these requirements and preserves the oxidative capacity of the liver.

1722 THE EFFECT OF AEROBIC PREINCUBATION ON ANAEROBIC GLYCOGENOLYSIS IN LIVER SLICES. *(E.)* Gaja, G. (Inst. Gen. Path., U. Milan, Italy) and M. E. Ferrero. *FEBS Letters* 6(1):31-33, 1970.

The effect of aerobic preincubation on anaerobic glycogenolysis was studied in liver slices both from fed and starved, glucose-injected rats. During anaerobic incubation and absence of substrate, the glycogen disappearing from liver slices of fed rats was accounted for by glucose and lactate recovered in the system. Previous aerobic incubation with oxygen activated anaerobic glycogenolysis and increased both glucose and lactate production. In fed rats, fructose mimics the effect of aerobic preincubation on glycogen breakdown; preincubation cannot further stimulate glycogenolysis, which is already fully released. In starved, glucose-injected rats, having initial moderate glycogen content, the amount of glycogen that disappeared during anaerobic incubation is less than in fed rats. Glycogen breakdown and lactate production increased in the absence of additional substrate; in the presence of glucose and previous incubation in oxygen, glycogenolysis is twice as fast and glycolysis is approximately 8 times greater. Fructose stimulates glycogenolysis, which is not further activated by aerobic preincubation, whereas lactate production, which is higher in the presence than in the absence of fructose, is further stimulated by oxygen preincubation. Increased anaerobic glycogenolysis caused by oxygen preincubation and fructose (both increase lactate formation) indicates the existence of a poorly defined, reciprocal relationship between glycogenolysis and glycolytic rate in the liver.

1723 THE SPECIFITY OF OSMORECEPTORS IN THE LIVER. *(Ger.)* Haberich, F. J. (Physiol. Inst., Free U., Berlin, Germany), O. Aziz, P. E. Nowacki and W. Ohm. *Pflueger Arch Ges Physiol* 313(4):289-299, 1969.

Water and 1.8% NaCl solution infused simultaneously and at equal rates into the portal vein and vena cava inferior, resp., of non-anesthetized rats with indwelling catheters caused a marked diuretic response. Reversal of the infusion sites (NaCl into the portal vein and water into the vena cava) was associated with transient antidiuresis. Small amounts of hypertonic solution injected alternately into the portal vein and inferior vena cava had antidiuretic effects only when administered intraportally. Intraportal infusions of sodium-free solutions showed that the diuretic response mediated by the liver is indirectly proportional to the osmotic concentration of the infused solution. The diuretic response to infusion of water into the abdominal aorta was quantitatively and qualitatively similar to that of an intracaval infusion. Variations in hepatic blood flow (produced in non-anesthetized animals by extracorporeal portocaval shunt) had no effect on urinary flow rates. There appears to be specific osmoreceptors in the liver which when stimulated change the osmotic concentration of the portal blood. These osmoreceptors apparently are active in the hypo- and hypertonic range and influence urinary secretion prior to significant changes in osmolarity of systemic blood (thus occupying primary position in osmoregulatory processes and preceding the cerebral osmoreceptors of Verney).

1724 PHOTODECOMPOSITION OF BILIRUBIN AND BILIVERDIN *IN VITRO*. *(E.)* Ostrow, J. D. (Dept. Med., Case Western Reserve U., Cleveland, Ohio) and R. V. Branham. *Gastroent* 58(1):15-25, 1970.

Decomposition of bilirubin and biliverdin under intense fluorescent light was studied *in vitro* at pH levels ranging from 7.4 to 13.0. Photodecay of bilirubin was more rapid at a higher pH if albumin was absent, but more rapid at a lower pH if albumin was present, whereas biliverdin was more stable at a lower pH, with or without albumin. During illumination at lower pH levels, albumin stabilized biliverdin but accelerated decay of bilirubin; these effects were not altered by competitive uncoupling of bilirubin from albumin or by chelation of contaminant divalent cations with ethylenediaminetetraacetic acid. Studies with a variety of fluorescent lamps demonstrated that wavelengths between 400 and 600 mμ were most effective in destroying bilirubin, ultraviolet light was less effective, and red light (>600 mμ) was ineffective. Photodecay of both bilirubin and biliverdin was oxidative, but exclusion of oxygen did not arrest photodecay of bilirubin if albumin was present also. By radiochromatography and by reillumination of photoderivatives of ^{14}C-bilirubin, the process of photodecay proceeded from bilirubin to biliverdin to weakly diazo-reactive derivatives to highly polar, diazo-negative products.

1725 GLYCYL-tRNA SYNTHETASE FOR RAT LIVER: THE ROLE OF tRNA IN FORMATION OF GLYCYLHYDROXAMATES. *(E.)* Favorova, O. (Inst. Molec. Biol., USSR Acad. Sci., Moscow) and L. Kisselev. *FEBS Letters* 6(2):65-68, 1970.

1726 ACCUMULATION OF OXIDIZED DIPHOSPHOPYRIDINE NUCLEOTIDE IN MOUSE LIVER AFTER ADMINISTRATION OF REDUCED DIPHOSPHOPYRIDINE NUCLEOTIDE. *(E.)* Everse, J. (Grad. Dept. Biochem., Brandeis U., Waltham, Mass.), N. O. Kaplan and S. Schichor. *Arch Biochem Biophys* 136(1):106-111, 1970.

1727 INCREASED HEPATIC MICROSOMAL ACTIVITY INDUCED BY SPIRONOLACTONE AND OTHER STEROIDS. *(E.)* Solymoss, B. (Inst. Med. Exp. Surg., U. Montreal, Quebec), H. G. Classen and S. Varga. *Proc Soc Exp Biol Med* 132(3):940-942, 1969.

1728 RAT HEPATOMA DNA POLYMERASE: PARTIAL ANALYSIS OF THE *IN VITRO* DNA PRODUCT. *(E.)* Laszlo, J. (Duke U. Med. Ctr., Durham, N.C.), D. S. Miller, O. Brown and E. Baril. *Biochem Biophys Res Commun* 38(1):112-118, 1970.

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1735 THE ROLE OF HORMONES IN GLUCOSE REPRESSION IN RAT LIVER. *(E.)* Soling, H. D. (Med. Sch., U. Wisconsin, Madison), J. Kaplan, M. Erbstoeszer and H. C. Pitot. *Advances Enzym Regulat* 7:171-182, 1969.

1736 TIME-DEPENDENT VARIATIONS IN AMINO ACID METABOLISM: MECHANISM OF THE TYROSINE TRANSAMINASE RHYTHM IN RAT LIVER. *(E.)* Wurtman, R. J. (Dept. Ntr. Food Sci., Massachusetts Inst. Technol., Cambridge). *Advances Enzym Regulat* 7:5767, 1969.

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- P:Secr:Stom (1671)
- P:Secr:Panc (1692)
- D:Stomduo (1879)
- D:S.Intest (1950)
- D:Livbil (2063)(2077)
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- D:Livbil:Gallb (2164)

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ACTASE FRACTIONS FROM MONKEY SMALL INTESTINE. *(E.)*
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wo lactase fractions (L_1 and L_2) with no apprecia-
le activity towards o-nitrophenyl β-galactoside
ave been purified up to 165- and 128-fold with a
ecovery of 6 and 7% respectively from monkey
Macacomullata or *M. radiata*) small intestinal mu-
osa. Both fractions efficiently catalyzed α- and
-lactose hydrolysis, and hydrolyzed cellobiose at
lower rate. The hydrolysis of hetero-β-galacto-
ides was very low (relative to lactose hydrolysis),
nd melibiose was not hydrolyzed by either fraction.
he percentage inhibition at various concentrations
f Tris was the same for both fractions, which were
nhibited also by glucono- or galactono-lactones
nd urea. Using fraction L_1, the K_m value for lac-
ose was 2.7 x 10^{-2}M, and the K_m for cellobiose was
.5 x 10^{-2}M; using fraction L_2, the K_m for lactose
as 1.7 x 10^{-2}M, and the K_m for cellobiose was 1.1
10^{-2}M (indicating that the kinetic properties of
he 2 fractions are almost identical). A broad pH
ptimum (5.2-5.7) was observed for the hydrolysis
f lactose by fraction L_1; a pH of 5.6 was optimal
or fraction L_2.

783 PREPARATION AND PROPERTIES OF RETINAL-OXIDIZING ENZYME FROM RAT INTESTINAL MUCOSA. *(E.)* Moffa, D. J. (West Virginia U. Sch. Med., Morgantown), F. J. Lotspeich and R. F. Krause. *J Biol Chem* 245(2):439-447, 1970.

Retinal-oxidizing enzyme was isolated from the proximal half of the small intestine of male Wistar rats and purified by a combination of acetone and ammonium sulfate precipitation, and diethylaminoethyl cellulose ion exchange chromatography. The enzyme appeared homogeneous (on the basis of ultracentrifugation, ion exchange chromatography, and polyacrylamide gel electrophoresis) and exhibited a molecular weight of approximately 80,000, an isoelectric point of 6.7, and contained 2 moles of non-heme iron per mole of enzyme. The enzyme stoichiometrically and irreversibly converted retinal to retinoic acid, exhibiting Michaelis-Menten kinetics, with the reaction rate constant for 120 min directly proportional to the enzyme concentration. The pH optimum was about 7.7 and the rate of the reaction was increased by the addition of ferrous ions. The reaction proceeded well under both aerobic and anerobic conditions, and the enzyme acted upon both the all-*trans* and 13-*cis* forms of retinal. Retinoic acid was identified as the reaction product by ultraviolet absorption spectrum, thin layer chromatography, and gas chromatography. Reduced nicotinamide adenine dinucleotide noncompetitively inhibited the reaction and was found to exhibit a control over the utilization of retinal *in vitro*. Thiols and metal ions stimulated the reaction, while thiol inhibitors and chelators inhibited it. Retinal-oxidizing enzyme apparently is a metalloprotein which requires sulfhydryl groups for maximal enzymic activity and which resembles a dehydrogenase rather than an oxygenase or oxidase.

1784 CHANGES IN ENZYME LEVELS ACCOMPANYING DIFFERENTIATION OF INTESTINAL EPITHELIAL CELLS. *(E.)* Irmondi, A. R. (Sloan-Kettering Inst., Cancer Res., New York, N. Y.), M. E. Balis and M. Lipkin. *Exp Cell Res* 58(2-3):323-330, 1969.

A newly designed planing apparatus was used to separate cells of known ages from the crypts and villi of upper jejunum of male Carworth Farm rats (130-180 g). At 10 hr after ^{3}H-thymidine i.p. injection the bulk of labeled DNA was still in the crypt region and at 26 hr these labeled cells had migrated onto the villi and reached the villus tips in 50 hr. Thymidine kinase was confined to crypt cells and disappeared rapidly as the cells reached the crypt-villus junction. Thymidylate phosphatase and adenylate deaminase were distributed uniformly from the crypts to the villus tips. Increases in adenosine deaminase, nucleoside phosphorylases and purine phosphoribosyltransferases were found to accompany the differentiation and migration of mucosal cells. The method provides a system for studying changes in macromolecular synthesis and the regulatory control of cell differentiation in the normal intestine through biochemical and physical analysis of the separated cells.

1785 LOCALIZATION OF RABBIT INTESTINAL SUCRASE WITH FERRITIN-ANTIBODY CONJUGATES. *(E.)* Gitzelmann, R. (Dept. Pediat. U. Zurich, Switzerland), T. Bachi, H. Binz, J. Lindemann and G. Semenza. *Biochim Biophys Acta* 196(1):20-28, 1970.

Precipitating noninhibitory antisera to isolated rabbit small intestinal sucrase-isomaltase were prepared from guinea pigs. Immunoglobulin G (IgG) of this sera and of control sera were conjugated with horse spleen ferritin, for immunoreaction with adult rabbit small intestinal mucosa. Specific ferritin-labeling of microvilli occurred at the luminal surface of the enterocytes. Electron microscopic examination of mucosa fragments showed ferritin imbedded into the surface coat, appearing as single molecules or in clusters. Usually the concentration of ferritin was highest at the apical portions of microvilli and appeared to a lesser degree near the base. Anti-rabbit sucrase IgG bound to ferritin recognized an antigenic site at the epithelial cell surface. Minimal distance between the edges of the ferritin cores and the microvillus membranes was 120 Å, indicating that the sucrase antigen was located at the membrane surface and did not project into the intermicrovillous space. Labeling was more pronounced after removal of the enteric surface coat by careful trypsin digestion.

1786 FORMATION AND LOSS OF D.N.A. IN INTESTINAL EPITHELIUM. *(E.)* Appleton, T. C. (Med. Res. Council, London, England), S. R. Pelc and M. H. Tarbit.

The hypothesis that all nuclei containing labeled DNA in the intestinal epithelium of mice divide before migrating into the villi and that the amount of labeled DNA is constant during cell passage through the villi was investigated. Mice (TO) were sacrificed 40 min, 12, 18, 24, 30 and 36 hr after a single i.p. injection of ^{3}H-thymidine. Autoradiographs of jejunal segments, prepared by stripping film technique, showed the following grain counts per labeled nucleus: 13.4 in the crypts at 40 min, 12.1 in the villi at 24 hr, and 4.4. in the crypts at 24 hr. The grain count per labeled nucleus at 24 hr was 7.9 for those cells nearest the crypts and 12.0 to 14.8 for those cells nearest the tips of the villi. In a second series of experiments the grain per labeled nucleus were 20.5 at 40 min in the crypts and 17.7 at 24 hr in the villi. The average grain counts for the first 6 labeled nuclei in the villi was 17.2 at 12 hr and 11.7 at 36 hr. The data suggests that a considerable proportion of the nuclei labeled in the crypts migrate into the villi without subsequent division and that labeled DNA is lost during passage through the villi. The hypothesis of formation of metabolic DNA during differentiation, and loss during function offers an explanation of the findings.

1787 THE STIMULATING EFFECT OF LOW pH ON THE AMINO ACID TRANSFERRING SYSTEMS OF THE SMALL INTESTINE. *(E.)* Thompson, E. (Dept. Physiol., U. Sheffield, England), R. J. Levin and M. J. Jackson. *Biochim Biophys Acta* 196(1):120-122, 1970.

The effect of pH on amino acid transferring systems was studied using everted sacs of mid-jejunum of female rats, incubated *in vitro*. Except for methionine, the amino acids tested had their transfer significantly increased by lowering the pH to 6.3 (compared to the control transfers at pH 7.3). The effect was observed in phosphate and bicarbonate saline buffers; therefore, the stimulation is most likely caused by the low pH rather than by the changes in HCO_3- or $PO_4{}^{3-}$. In both buffers the transfers of proline, sarcosine and β-alanine are stimulated more by low pH than those of glycine and leucine. Methionine transfer is apparently unchanged by low pH. Glycine transfer, however, in the presence of 15 mM methionine, is dramatically stimulated by 172% at low pH. It appears that transfer by the 'sarcosine system' is stimulated more by low pH than that by the methionine system. Transfer potential difference measurements indicate that it is the electrogenic active transfer mechanism for amino acids that is stimulated by low pH. It may be concluded that low pH, in the physiological range for the jejunum *in vivo*, stimulates the transfer of a variety of amino acids.

1788 EXPERIMENTAL ESTIMATION OF SOME PROPERTIES OF THE CHOLINERGIC RECEPTORS IN THE SMOOTH MUSCLE OF GUINEA PIG ILEUM. *(E.)* Tschope, E. (Dept. Pharmacol., Christian Albrechts U., Kiel, Germany). *Europ J Pharmacol* 8(2):215-220, 1969.

1789 FUNCTIONAL COMPENSATION IN THE FIRST TWELVE WEEKS AFTER SMALL INTESTINE RESECTION IN THE RAT. *(E.)* Wapnick, S. (Roy. Postgrad. Med. Sch., London, England), S. M. Mantoudis and A. G. Cox. *Brit J Surg* 56(11):864-866, 1969.

- P:Morph (1566)(1567)(1568)(1593)(1617)
- P:Absorp (1626)(1628)(1629)(1630)(1631)(1633)(1634)(1637)
- P:Motil (1646)(1647)
- D:S.Intest (1925)

790 THE EFFECT OF GLUCAGON ON HEPATIC BLOOD FLOW: AN EXPERIMENTAL STUDY IN THE DOG.
E.) Schenk, W. G., Jr. (Edward J. Meyer Mem.
osp., Buffalo, N. Y.), N. G. Kock, B. Roding, P.
ahnloser and S. Tibblin. *Arch Surg* 100(2):147-149,
970.

he effect of glucagon (1 μg, 5 μg and 10 μg/kg,
.v.) on the hepatic hemodynamics of anesthetized
ogs was studied using an electromagnetic flow me-
er. With 5 μg/kg of glucagon, the portal vein
esting flow level of 20 ml/kg/min increased to a-
out 35 ml/kg/min within 3 min, the portal vein
ressure increased from 10 to 16 mm Hg, and the he-
atic arterial pressure decreased from 135 to 112
m Hg. With 1 μg/kg of glucagon, the same responses
ere obtained, but their magnitude was less. Ten
g/kg of glucagon produced a maximal flow increase
n the portal vein of 90% (within 4 min after in-
ection), and a 70% maximal increase in portal vein
low (flow and pressure reached basal levels after
bout 35 min). There was a transient increase in
epatic artery flow corresponding in time to a
ransient decrease in hepatic artery pressure. In
2 dogs with splenectomy, similar hemodynamic re-
sponses to glucagon were noted. Injection of 1 μg/
kg of glucagon produced a 100% increase in blood
glucose but a second injection, while glucose was
almost at peak level, did not produce a further
rise in blood glucose. Glucagon apparently produces a transient decrease of the resistance in the arterial bed of the liver and the primary cause of the increased blood flow through the liver probably is produced by a vasodilatory action of glucagon on the splanchnic vascular bed.

1791 INFLUENCE OF THE LIVER ON ARTERIOVENOUS FISTULAS. *(E.)* Mooney, C. S. (U. Kentucky Coll. Med., Lexington), A. D. Honaker and
W. O. Griffen, Jr. *Arch Surg* 100(2):154-156, 1970.

1792 REVERSAL OF THE VENOUS CIRCULATION THROUGH THE CANINE LIVER. *(E.)* Kirkegaard-Jensen,
U. (Copenhagen County Hosp., Hellerup, Denmark) and
M. R. Hales. *Acta Chir Scand* 135(8):689-694, 1969.

1793 ORIGIN AND DISTRIBUTION OF PORTAL BLOOD IN THE CAT AND THE RABBIT. *(E.)* Heath,
T. (Sch. Phys., U. New South Wales, Kensington,
Australia) and B. House. *Amer J Anat* 127(1):71-80,
1970.

1794 THE EFFECT OF SODIUM HYPOCHLORITE ON *ASCARIS* EGGS AND CYSTS OF *ENTAMOEBA HIS-*
TOLYTICA. (E.) Grubb, T. C. (Sch. Med., U. Puerto
Rico, San Juan) and J. Oliver-Gonzalez. *Rev Lat
Amer Microbiol* 11(4):199-207, 1969.

1795 EXPERIMENTAL THERAPY OF INTESTINAL RADIATION REACTIONS IN PATIENTS UNDERGOING ABDOMINAL IRRADIATION. *(E.)* Neumeister, K. (Radiol. Clin. Karl Marx U., Leipzig, Germany). *Radiobiol Radiother* 10(6):843-845, 1969.

1796 ANALYSIS OF BETA RECEPTOR DRUG INTERACTIONS IN ISOLATED RABBIT ATRIUM, AORTA, STOMACH, AND TRACHEA. *(E.)* Bristow, M. (U. Illinois Med. Ctr., Chicago), T. R. Sherrod and R. D. Green. *J Pharmacol Exp Ther* 171(1):52-61, 1970.

1797 ISOLATION OF LYSTERIA MONOCYTOGENES FROM FECES OF CLINICALLY HEALTHY HUMANS AND ANIMALS. *(E.)* Kampelmacher, E. H. (Natl. Inst. Publ. Hlth., Utrecht, Netherlands) and L. M. van N. Jansen. *Zbl Bakt (Orig)* 211(3):353-359, 1969.

1798 DETECTION OF HEALTHY CARRIERS OF SALMONELLAE AND SHIGELLAE. *(Jap.)* Onogawa, T. (Tokyo-to Assoc. Preventive Med., Japan), T. Terayama and S. Sakai. *J Jap Ass Infect Dis* 43(9):225-231, 1969.

1799 HEPATIC RESPONSE TO EPINEPHRINE FOLLOWING HEPATIC ARTERY LIGATION IN DOGS. *(E.)* Horvath, S. M. (Inst. Environ. Stress, U. California, Santa Barbara), A. D. Bender and E. A. Farrand. *Arch Int Pharmacodyn* 182(1):190-197, 1969.

- P:Morph (1571)(1572)(1597)(1598)(1599)(1600)
- P:Absorp (1627)
- P:Motil (1656)
- P:Secr (1665)
- P:Secr:Stom (1672)
- P:Secr:Panc (1688)
- P:Secr:Hepatobil (1694)(1700)(1704)(1709)(1768)

DIAGNOSTIC PROCEDURES

1800 GASTRIC ANGIOGRAPHY. *(E.)* Reuter, S. R. (U. California San Diego, La Jolla), H. C. Redman, W. J. Miller and P. A. Hoskins. *Radiology* 94(2):271-276, 1970.

Thirty-six patients with gastric lesions (18 adenocarcinoma, 13 benign gastric ulcer and 5 leiomyoma) were studied angiographically. Upper gastrointestinal barium studies were also performed on 34 of these patients. The correct angiographic diagnosis was made in 15 of the 18 patients with carcinoma because of infiltration of gastric arteries or a combination of infiltration and tumor vessels. The correct diagnosis was made in 14 of 17 patients with carcinoma undergoing barium examination. The correct diagnosis was made in only 7 of 13 patients with benign ulcers because angiographic abnormalities in these lesions frequently simulated carcinoma, while 9 of 12 ulcer patients receiving the gastrointestinal series were correctly diagnosed. All patients with leiomyomas were correctly diagnosed angiographically even though 3 had abnormal arterial findings. The same results were obtained with the barium studies. Although not useful as a primary diagnostic method, angiography helped define the extent of local invasion and presence of liver metastases.

1801 A COMPARATIVE STUDY OF ARTERIOGRAPHY AND SCINTILLOGRAPHY IN SPACE OCCUPYING LESIONS OF THE LIVER. *(E.)* Kreel, L. (Roy. Free Hosp., London, England). *Arq Gastroent* 6(4):209-215, 1969.

Arteriography and scintillography were compared in 71 patients with space occupying liver lesions: 33 patients were examined by scintiscan; 38 patients were examined by arteriography; both techniques were used in 23 cases. Ten illustrative cases discussing these methods are presented. Radiocolloids such as radiocolloidal gold ^{198}Au or ^{99}Technetrium colloidal sulphide are readily taken up by Kupffer cells in detection of intrahepatic space occupying lesions by scintillography. Space occupying lesions are revealed by diminished or lack of radioactive uptake in part of scan image, due to few or hypofunction of cells which are selective in isotope uptake. Consideration of variation is essential when scan margin irregularities are evaluated. Scintiscan may also suggest presence of space occupying liver lesions when the liver is very small. The smallest lesion detachable on scintiscan appears to be 3 cm in diameter. Vascular liver lesions will not be shown if functioning Kupffer cells are present, whereas highly vascular tumor nodules will be evident on arteriography at a diameter of 1 cm. Space occupying lesions demonstrated by scintillography have same appearance whether due to a cyst, malignant tumor, metastatic deposit or hemangioma; angiography can often distinguish between these conditions. Vascular displacement which usually affects both arteries and veins, is the major sign of space occupying lesions on arteriography. Arteriography and scintillography are complementary techniques in the diagnosis of space occupying liver lesions.

1802 PRESENT STATUS OF GASTROSCOPY AND ESOPHAGOSCOPY. *(E.)* Sullivan, B. H., Jr. (Cleveland Clin., Ohio). *Nebraska Med J* 55(1):14-18, 1970.

An overview of the current status of gastroscopy and esophagoscopy is presented. New fiberoptic esophagoscopes and gastroscopes with external light sources and improved biopsy and photographic capabilities are safer and more effective than previous instruments. Blind areas of the stomach are greatly reduced so that virtually all of the esophagus and the stomach can be inspected safely, photographed well, and biopsied for diagnosis. These methods of diagnosis of gastric and esophageal lesions should be used when other methods of examination are negative, confusing or inconclusive. Endoscopy provides a permanent record of observations which are useful for decision-making by other physicians concerned with the patient's care. Cine-photographs aid in physiologic observations and in the detection of briefly seen lesions. Photographs provide useful comparisons at follow-up studies and are an invaluable training adjunct. Full use of the biopsy capability of the new instruments will improve diagnostic skill and overcome the skepticism with which the method has been regarded.

1803 ROLE OF LIVER SCANNING IN THE PREOPERATIVE EVALUATION OF PATIENTS WITH CANCER. *(E.)* Poulose, K. P. (Johns Hopkins Med. Inst., Baltimore, Md.), R. C. Reba, F. H. Deland and H. N. Wagner. *Brit Med J* 4(5683):585-587, 1969.

The liver scans of 72 patients with proved hepatic malignancy (18 primary and 54 metastatic) were studied. Well-defined, focal defects were shown in 83% (20% single, 63% multiple defects) of patients with metastic and 77% (56% single, 21% multiple defects) of patients with primary liver carcinoma. (In 10% of those with metastic liver disease the distribution of radioactivity was normal.) Four or more biochemical liver function tests were normal in 33% of the metastatic and 29% of the primary liver cancer patients. Only 56% of the patients with metastic liver cancer and 30% of those with primary liver cancer had high serum alkaline phosphatase. Of the patients with liver metastases 7% had a monhomogeneous scan pattern similar to that seen in cirrhosis. Liver scanning helps in the selection of the proper biopsy site. Thirty-three percent of the patients with primary cancer of the liver, and 7% of those with liver metastases showed splenomegaly in the scan. Hepatic enlargement was present in the scan in 94% of the patients with liver metastases, while data obtained from 104 necropsies of patients with hepatic metastases showed that only 46% had hepatomegaly. These findings indicate that a liver scan should be performed on every patient with known malignancy (regardless of normal liver size or normal liver function tests) before major tumor surgery.

1804 ADVANCES IN PEDIATRIC GASTROINTESTINAL INTUBATION. *(E.)* Toyama, W. M. (Marsh-

ield Clin., Wisconsin). *Bull Mason Clin* 23(4):
52-263, 1969.

ew and modified techniques in the use of gastro-
ntestinal intubation in infants and children are
escribed. In the removal of foreign bodies from
he esophagus, it is recommended that a Foley
atheter, number 8 or 10F with a three millimeter
ag, be used in order to prevent overdistension of
he esophagus and the Foley bag should always be
nflated before insertion to assure symmetrical
istension. The intubation of the infant's empty
tomach with a neogastric tube made from a size 10
r 12F rubber Robinson catheter, with additional
oles in the distal 4 centimeters, makes palpation
f the abdominal wall easier while the infant is
eeding and facilitates the diagnosis of infantile
ypertropic pyloric stenosis. A sterilized poly-
thylene neogastric tube, size 10 or 12F, is used
s a modified Baker jejunostomy tube for decom-
ression and stretchless plication in small bowel
bstruction in infants and small childeren.

1805 SEQUENTIAL LIVER SCANNING. *(E.)* Johnston, G. S. (Letterman Gen. Hosp., San Francisco, Cal.) and A. E. Jones. *J Surg Oncol* 1(3):205-211, 1969.

The use of sequential liver scans is useful in evaluating the response to therapy of neoplastic diseases metastatic to the liver and of liver abscesses. Four typical cases of the clinical usefulness of this technique are presented. In one case an enlarging defect on the liver documented the rate of advance of the disease and predicted the failure of therapy. Thus, liver scans can form a basis for an accurate estimate of prognosis in a wide spectrum of liver diseases. Sequential scans are also useful in determining liver abscess resolution during antiamebic therapy.

1806 TRANSJUGULAR DILATION OF THE BILIARY DUCT SYSTEM. *(E.)* Hanafee, W. N. (U. California Los Angeles, Ctr. Hlth. Sci.), J. Rosch and M. Weiner. *Radiology* 94(2):429-432, 1970.

Transjugular dilation of the biliary duct for performing cholangiography was described in two patients with biliary stricture. In this technique, a needle and catheter system was introduced percutaneously into the internal jugular vein, passed through the superior vena cava, the right atrium, the inferior vena cava, hepatic veins and into the liver parenchyma. The bile duct was punctured from inside the liver for diagnostic cholangiography and coaxial dilation of a postoperative biliary stricture. The procedure was successful in one patient. Two important factors to be considered with this procedure are that puncture of bile duct must be made parallel to the long axis of the bile duct and in the direction of the hilus so that guide wires can be directed into duodenum, and that bacteremia will result if bile is infected (prophylactic antibiotics have greatly reduced post-cholangiogram fevers).

1807 ANGIOGRAPHIC DEMONSTRATION OF CARCINOMA OF THE GALLBLADDER. *(E.)* Abrams, R. M. (New York U. Med. Ctr., New York), C. H. Meng, H. Firooznia, E. R. Beranbaum and H. Y. Epstein. *Radiology* 94(2):277-282, 1970.

Gallbladder carcinoma was demonstrated by selective celiac and superior mesenteric angiography on 6 patients. Characteristic features were an enlarged or normal-sized common hepatic artery, an enlarged cystic artery with either cuffing of a major branch or its smaller branches or a complete amputation of at least one branch, and presence of neovasculature in the gallbladder wall. In the venous phase, the opacified gallbladder was not of uniform thickness. In 5 of the 6 cases, there was advanced disease with spread to the liver, and resection was not feasible. Findings of a previous study are also reviewed.

1808 RADIOIMMUNOASSAY OF GASTRIN. *(E.)* Yalow, R. S. (VA Hosp., Bronx, N. Y.) and S. A. Berson. *Gastroenterology* 58(1):1-14, 1970.

Gastrin antisera, suitable for a sensitive radioimmunoassay of plasma gastrin in man, were readily produced in guinea pigs by immunization with relatively small amounts of unconjugated crude porcine gastrins. Highly purified ^{125}I-porcine gastrin I, further purified on starch gel electrophoresis after labeling, was employed as tracer, and an anionic exchange resin was used to separate bound and free labeled gastrin. Sensitivity is better than 5 pg/ml. Cholecystokinin-pancreozymin and amino-terminal and carboxyl-terminal gastrin peptides cross-react only poorly in the gastrin-antigastrin system. Plasma gastrin and standard gastrin show parallel inhibition curves against the labeled porcine gastrin. The immunochemical reactivity of endogenous plasma gastrin is not impaired by boiling for 5 to 10 min. Thirty of 63 adult (the majority over 45 yr old) hospital patients without suspected gastrin abnormalities had fasting immunoreactive plasma gastrin concentrations less than 75 pg/ml (porcine gastrin equivalent). High values of plasma gastrin were observed in 5 patients with Zollinger-Ellison syndrome and in 17 patients with pernicious anemia. (Among the 5 patients with Zollinger-Ellison syndrome, 4 had concentrations from 1.5 to 10 ng/ml, and 1 of 250 ng/ml. Fourteen of the 17 patients with pernicious anemia had levels ranging from 600 to 9000 pg/ml; the other 3 had levels of 300, 380, and 500 pg/ml, resp). Oral administration or intragastric instillation of 300 ml of 0.1N HCl in 5 patients with pernicious anemia produced an acute drop in plasma gastrin concentration, with a rate and magnitude indicating that the half-time for endogenous plasma gastrin turnover is at least 7 min.

1809 CINERADIOGRAPHIC EVALUATION OF THE ESOPHAGUS IN NORMAL ADULTS. A STUDY OF 146 SUBJECTS RANGING IN AGE FROM 21 TO 90 YEARS. *(E.)* Mandelstam, P. (U. Kentucky Coll. Med., Lexington) and A. Lieber. *Gastroenterology* 58(1):32-39, 1970.

Pharyngeal and esophageal morphology and motor function (deglutition, peristalsis, nonperistaltic contractions, esophageal emptying time, dilation and reflux, Schatzki's ring) were assessed by fluoroscopy and cineradiography in 146 normal subjects (21 to 90 yrs old). Inadequate pharyngeal emptying manifested by marked vallecular pooling occurred in only 1 subject (an 82-yr-old man) and the quality of the primary peristaltic wave, the incidence of nonperistaltic contractions, and the mean upright and recumbent esophageal emptying times were constant up to the 61 to 70 age period. There was considerable variation from subject to subject within age groups in the esophageal responses to deglutition and successive swallows. Hiatus hernia (upon prone oblique examination without special maneuvers) occurred in 38/73 (52%) men and 19/73 (26%) women, and did not increase with age, and was associated with gastroesophageal reflux in slightly less than half of the subjects with hiatus hernia but in no subject without hernia.

1810 PROGRESS IN THE SYMPTOMATOLOGY OF LIVER DISEASES. *(It.)* Ziliotto, D. (Inst. Symptomatol. U. Padua, Italy) and G. Ferlin. *Acta Isotop* 8(4):355-370, 1969.

The scintillation camera of Anger was used for liver examinations after injection of technetium (Tc) 99m, sulfur colloid or radioiodinated rose bengal. Using Tc 99m, satisfactory images created by 5x10^5 to 6x10^5 impulses were obtained with an exposure time of 20 to 60 seconds, and a complete evaluation of the liver in all three projections could be carried out within 3 to 5 min. Tc 99m also enabled satisfactory visualization of the spleen even in cases where splenic radioactivity uptake was not particularly high. Using rose bengal, information was obtained on hepatic morphology as well as functional capacity.

1811 THE USE OF ULTRASOUND IN THE DIAGNOSIS OF CYSTIC LESIONS OF THE LIVER AND UPPER ABDOMEN AND IN THE DETECTION OF ASCITES. *(E.)* McCarthy, C. F. (U. Bristol, United Bristol and Southmead Hospitals, England), P. N. T. Wells, F. G. M. Ross and A. E. A. Read. *Gut* 10(11):904-912, 1969.

The use of ultrasonic A- and B-scans in diagnosis of cystic lesions of liver and upper abdomen and in ascites detection was studied in 16 patients. Lesions were clearly distinguished from solid masses when either A- or B-scans were used and the presence of as little as 300 to 800 ml of i.p. fluid was detected by either technique. Ultrasonic scan is helpful in the following suspected clinical situations: liver abscess, hepatomegaly, localized liver mass, hydatid disease of liver, and ascites. A-scan equipment is simple and rather inexpensive for practice, yet is adequate for diagnosis, although fluid detection is more difficult.

1812 RADIOLOGY OF INTESTINAL OBSTRUCTION. *(Fr.)* Simon, G. C. (Montfermeil, France). *Rev Prat* 19(32):4625-4716, 1969.

1813 CURRENT STATE OF ROUTINE ROENTGENOLOGICAL DIAGNOSIS OF THE BILIARY TRACT. *(Ger.)* Kunz, B. (2nd Med. Clin., Humbolt U., Berlin, Germany), H. Gunther and H. Ficker. *Deutsch Gesundh* 24(47):2224-2227, 1969.

1814 AN EXPERIMENTAL STUDY ON THE DETECTABILITY OF LIVER TUMOR WITH SCANNING, WITH SPECIAL REFERENCE TO γ-ENERGY OF THE NUCLIDES. *(Jap.)* Watanabe, K. (Fac. Med., Kyushu U., Japan), M. Okazaki, H. Nakata, M. Inakura, E. Nakagawa and Y. Numaguchi. *Nippon Acta Radiol* 29(5):502-512, 1969.

1815 EVALUATION OF THE LABORATORY EXAMINATION IN THE DIAGNOSIS OF HIDATIDOSIS. *(Sp.)* Apt, W. (Sch. Med., U. Chile, Valparaiso), F. Knierim, C. Calderon and E. Taucher. *Rev Med Valparaiso* 22(4):232-243, 1969.

1816 A NEW CONTRAST MEDIUM IN DIGESTIVE RADIOLOGY. *(Fr.)* Wattez, E. (Cochin Hosp., Paris, France) and J. H. Baut. *Ann Radiol (Paris)* 12(7-8):725-730, 1969.

1817 RETROGRADE COLONOSCOPY. *(E.)* Fox, J. A. (Edgeware Gen. Hosp., England). *Endoscopy* 1(4):182-185, 1969.

1818 DIAGNOSIS OF BILE TRACT DAMAGE WITH THE HELP OF PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY. *(Ger.)* Bayindir, S. (Surg. Clin., U. Geissen, Germany). *Acta Hepatosplen* 16(6):371-382, 1969.

1819 ADVANCEMENTS IN RADIOLOGY IN GALLBLADDER AND BILIARY TRACT DISEASES. *(E.)* Sarin, N. K. (V. J. Hosp., Amritsar, India) and Y. P. Bhandari. *Punjab Med J* 19(3):119-122, 1969.

1820 GALLBLADDER OPACIFICATION AFTER PYELOGRAPHY. *(E.)* Rapoport, K. D. (E. A. Horton Mem. Hosp., Middletown, N. Y.). *Invest Radiol* 4(6):398, 1969.

1821 CLEARANCE OF SULFOBROMOPHTALEIN IN THE AGED. *(Sp.)* Tuchszer, S. (Hosp. Geriat. Gen. M. Rodriguez, Buenos Aires, Argentina), J. Levin, L. Fiszlejder, B. Schcolnicov, R. Rigilo and F. O. Kramer. *Prensa Med Argent* 56(29):1437-1441, 1969.

1822 SIMULTANEOUS SURVEY AND LATERAL DECUBITUS CHOLECYSTOGRAM. *(E.)* Dietz, M. W. (Burge-Protestant Hosp., Springfield, Mo.). *Invest Radiol* 4(6):398-399, 1969.

1823 CLINICAL TECHNIQUE OF DIRECT VISION GASTROBIOPSY. *(Ger.)* Stadelmann, O. (Med. Clin. Polyclin., U. Erlangen-Nuremberg, Germany). *Endoscopy* 1(4):185-188, 1969.

1824 INFUSION CHOLECYSTO-CHOLANGIOGRAPHY. *(Ger.)* Meyer-Burg, J. (St. Hosp., Spandau, Germany) and U. Wilhelmi. *Schweiz Med Wschr* 99(49):1793-1796, 1969.

- P:Morph (1574)
- D:Stomduo:Peptulc (1918)
- D:L.Intest (1998)
- D:Livbil (2034)(2078)(2080)
- D:Livbil:A.Nonv.Hep (2100)
- D:Livbil:A.V.Hep (2104)
- D:Livbil:Gallb (2163)(2168)(2180)
- D:Gen (2189)
- D:Gen:Parasit (2267)

GASTROINTESTINAL DISEASES

ESOPHAGUS

1825 SPLIT-COURSE RADIOTHERAPY IN THE TREATMENT OF CARCINOMA OF THE ESOPHAGUS. *(E.)* Levitt, S. H. (Med. Coll. Va., Richmond), A. B. Frazier and K. W. James. *Radiology* 94(2):433-435, 1970.

Effect of split-course radiotherapy was studied in 8 patients with localized squamous-cell cancer of the esophagus. Patients received 250 rads daily (5 treatments weekly) using either Cobalt-60 or 2-Mev. Following a 2 week interruption similar treatment was repeated. Results of treatment in the split-course regimen were compared to 17 patients with squamous cell carcinoma of the esophagus who received routine radiation (200 rads daily) without interruption. Routinely treated patients had a higher complication rate (tracheoesophageal fistula, gastrostomy) than split-dose-treated patients and a significantly greater number of the latter group survived 1 year or more. Preliminary results show a statistically significant increase in 1-year survival in patients with esophageal carcinoma given split-course radiotherapy compared to similar patients treated with conventional fractionated courses. Symptomatic relief and length of relief were at least as good in patients with conventional radiation. Continuation of clinical trials on a randomized basis is being considered.

1826 AN EVALUATION OF STEROIDS AND ANTIBIOTICS IN CAUSTIC BURNS OF THE ESOPHAGUS. *(E.)* Webb, W. R. (Dallas VA Hosp., Texas), P. Koutras, R. Ecker and W. L. Sugg. *Ann Thorac Surg* 9(2):95-102, 1970.

The effectiveness of steroids and antibiotics in preventing stricture formation was studied in 68 patients with corrosive burns of the esophagus. Drug therapy starting with prednisone, followed by penicillin or streptomycin and then ampicillin was carried out if esophagoscopy findings were positive. Early and prolonged administration of steroids and antibiotics did not reduce incidence of stricture formation. All third-degree burns, regardless of treatment, resulted in significant esophageal scarring and stricture. Development of scar tissue was not completely arrested even though steroid therapy was started within 24 hr after injury. In 5 of 18 patients with second degree burns, minimal strictures resulted after steroid and antibiotic treatment, but effectiveness of such treatment cannot be determined from this study. Esophagoscopy appears to be an accurate and safe method for investigating effects of caustic agents to determine degree and distribution of burns and their prognosis, but the use of steroid therapy perhaps delayed but did not prevent stricture formation.

1827 ACTION OF THE SODIUM BICARBONATE TREATMENT AT VICHY UPON HIATAL HERNIAS AND GASTROESOPHAGEAL REFLUX. *(Fr.)* Debray, C. (Hosp. Bichat, Vichy, France), J. de la Tour, M. Solere and J. Chariot. *Therapeutique* 45(9):853-858, 1969.

1828 CLINICAL EXPERIMENTATION WITH PARAPENZOLATE BROMIDE IN DIGESTIVE DISEASES. *(Fr.)* Perreau, P. (CHU, Angers, France) and J. L. Verret. *L'Ouest Med* 22(22):1564-1568, 1969.

1829 DIAGNOSTIC AND THERAPEUTIC PROBLEMS POSED BY ESOPHAGEAL ATRESIA: WITH REFERENCE TO THREE RECENT OBSERVATIONS. *(Fr.)* Laugier, J. (Gatien de Clocheville Hosp., Tours, France), J. C. Rolland, B. Delvert, J. H. Soutoul, P. A. Richard and G. Desbuquois. *L'Ouest Med* 22(22):1555-1558, 1969.

1830 ESOPHAGEAL CANCER FROM IRRITATIVE CICATRICIAL STRICTURES. *(Fr.)* Calvet, J. (Toulouse, France), J. Claux and J. Coll. *J Franc Otorhinolaryng* 28(9):633-635, 1969.

1831 RADIOLOGIC SEMINAR XCI: TRACHEOESOPHAGEAL FISTULA. *(E.)* Colbert, W. T. (Natchez Gen. Hosp., Mississippi). *J Mississippi Med Ass* 11(1):18-21, 1970.

1832 ESOPHAGEAL ULCER PERFORATED INTO THE LUNG. *(Fr.)* Ribet, M. (no affil), P. Fournier and A. Wurtz. *Presse Med* 77(53):1999, 1969.

1833 ESOPHAGEAL COMPLICATIONS OF VAGOTOMY. *(Fr.)* Patel, J. C. (no affil). *Presse Med* 77(49):1827, 1969.

1834 MID-THORACIC ESOPHAGEAL DIVERTICULA. *(Fr.)* Giuli, R. (no affil), B. Goyer and J. L. Lortat-Jacob. *Vie Med* 50(36):4523-4532, 1969.

1835 CERVICAL ESOPHAGEAL DIVERTICULA. *(Fr.)* Goyer, B. (no affil), R. Giuli and J. L. Lortat-Jacob. *Vie Med* 50(36):4507-4521, 1969.

1836 ATRESIA OF THE ESOPHAGUS AND TUMORS OF THE NECK. *(Fr.)* Carcassonne, M. (Marseilles, France). *J Franc Otorhinolaryng* 18(10):735-737, 1969.

1837 A CASE OF AORTO-ESOPHAGEAL FISTULA: A RARE COMPLICATION OF TERMINAL CANCER OF THE ESOPHAGUS. *(Fr.)* Lorriaux, A. (no affil), J. Baillet, J. P. Capron and P. Descombes. *Lille Med* 14(9):1039-1046, 1969.

1838 ESOPHAGEAL DIVERTICULA ABOVE THE DIAPHRAGM. *(Fr.)* Goyer, B. (no affil), R. Giuli, C. A. Richard and J. L. Lortat-Jacob. *Vie Med* 50(36):4535-4542, 1969.

1839 ESOPHAGEAL LESIONS IN LEUKEMIA AND LYMPHOMA. *(E.)* Givler, R. L. (Dept. Path., U. Iowa, Iowa City). *Amer J Dig Dis* 15(1):31-36, 1970.

1840 SURGERY FOR CANCER OF THE ESOPHAGUS: TECHNIQUE AND RESULTS. *(Por.)* Goffi, F. S. (Publ. Service Hosp., San Paulo, Brazil), R. G. Bevilacqua, E. A. B. Ferreir, P. A. Silva, Y. Pinheiro, E. W. Lima and E. da S. Bastos. *Rev Ass Med Brasil* 15(1):37-42, 1969.

1841 CORROSION OF THE ESOPHAGUS: RESULTS OF TREATMENT OF 11 ACUTE CASES. *(Dan.)* Andersen, K. (Bispebjerg Hosp., Denmark) and J. Falbe-Hansen. *Ugeskr Laeg* 132(2):41-46, 1970.

1842 CORROSIVE BURNS OF THE ESOPHAGUS. *(Sw.)* Kinnman, J. (Karolinska Hosp., Stockholm, Sweden). *Lakartidningen* 67(1):49-57, 1970.

1843 CANCER OF THE ESOPHAGUS. *(Sp.)* Mattar, A. B. (Reg. Hosp., Temuco, Chile) and L. S. Castillo. *Rev Med Valparaiso* 22(4):193-196, 1969.

1844 STENOSING NON-PEPTIC ESOPHAGITIS. *(E.)* Berman, J. K. (Methodist Hosp., Indianapolis, Indiana), G. A. Rowe and W. M. Waymire. *J Indiana Med Ass* 62(12):1404-1407, 1969.

1845 THE SURGERY OF ESOPHAGEAL DYSRHYTHMIAS. *(E.)* Nicks, R. (Roy. Prince Alfred Hosp., Sydney, Australia). *Aust New Zeal J Surg* 39(2):167-172, 1969.

1846 CONSIDERATIONS ON A CASE OF ESOPHAGEAL LEIOMYOMA ASSOCIATED WITH EPIPHRENIC DIVERTICULUM. *(It.)* Fivoli, E. (Hosp. Central, Rome, Italy), C. Orecchia and S. Broglia. *Chir Gastroent* 2(supp 1):104-119, 1968.

1847 ANTERIOR GASTROPEXY: A SIMPLE OPERATION FOR HIATUS HERNIA. *(E.)* Boerema, W. J. (Roy. Perth Hosp., W. Australia). *Aust New Zeal J Surg* 39(2):173-175, 1969.

1848 DISTURBANCES OF THE MOTILITY OF THE ESOPHAGUS. *(It.)* Edwards, D. A. W. (U. Coll. Hosp., London, England). *Recent Progr Med* 47(5):420-431, 1969.

1849 ESOPHAGEAL REPLACEMENT BY TRANSPOSED STOMACH FOLLOWING PHARYNGOLARYNGO-ESOPHAGECTOMY FOR CARCINOMA OF THE CERVICAL ESOPHAGUS. *(E.)* Stell, P. M. (Ear, Nose Throat Infirm., Liverpool, England). *Arch Otolaryng* 91(2):166-170, 1970.

1850 STIFF-MAN SYNDROME PRESENTING WITH COMPLETE ESOPHAGEAL OBSTRUCTION: REPORT OF A CASE. *(E.)* Baume, P. E. (Roy. North Shore Hosp., Crows Nest, Australia), M. J. Sulway and E. Davis. *Amer J Dig Dis* 15(1):79-84, 1970.

1851 ATRAUMATIC SO-CALLED "SPONTANEOUS" RUPTURE OF THE ESOPHAGUS. A REVIEW OF 47 PERSONAL CASES WITH COMMENTS ON A NEW METHOD OF SURGICAL THERAPY. *(E.)* Abbott, O. A. (Emory U. Sch. Med., Atlanta, Ga.), K. A. Mansour, W. D. Logan, Jr., C. R. Hatcher, Jr. and P. N. Symbas. *J Thorac Cardiovasc Surg* 59(1):67-83, 1970.

1852 ABDOMINAL EXPLORATION IN THE EVALUATION OF PATIENTS WITH CARCINOMA OF THE THORACIC ESOPHAGUS. *(E.)* Guernsey, J. M. (Stanford U. Sch. Med., Palo Alto, Calif.) and D. F. Knudsen. *J Thorac Cardiovasc Surg* 59(1):62-66, 1970.

1853 ENIGMA OF THE GASTROESOPHAGEAL JUNCTION. *(E.)* Ingelfinger, F. J. (New England J. Med., Boston, Mass.). *California Med* 112(1):80-81, 1970.

1854 DISEASES OF THE ESOPHAGUS: PRESENT CONCEPTS. *(E.)* Zboralske, F. F. (Stanford U. Sch. Med., Calif.) and G. W. Friedland. *California Med* 112(1):33-51, 1970.

1855 SPONTANEOUS PERFORATION OF THE ESOPHAGUS. *(E.)* Eustace, P. W. (Mater Misericordiae Hosp., Dublin, Ireland), J. S. R. Lavelle and F. X. O'Connell. *J Irish Med Ass* 62(390):435-436, 1969.

1856 ESOPHAGEAL TRANSIT IN PATIENTS WITH CHAGAS DISEASE (IN PANAMA). *(Sp.)* Blandon, R. (Gorgas Lab., Panama City, Panama), J. F. Guevara and C. M. Johnson. *Arq Gastroent* 6(4):189-196, 1969.

- Diagproc (1802)(1804)
- D:Livbil:Cirrh (2132)

1857 SERUM B_{12} AND SERUM IRON AFTER GASTRIC SURGERY. *(E.)* Schrumpf, A. (Postgrunn Hosp., Norway) and K. Gjertsen. *Acta Med Scand* 186(6):561-564, 1969.

Serum iron and vitamin B_{12} determinations were made in 63 patients immediately after gastric surgery (Billroth II) and every 6 months afterwards for a 2 year period. Immediately after surgery, 21 patients had lost intrinsic factor, most of them permanently. After 18 months, 18 of the 40 patients that were re-examined lacked intrinsic factor. Impaired absorption of labeled vitamin B_{12} was more frequent after surgery for stomach cancer (6 of 10 patients) than in patients with gastric ulcer (10 of 26) or duodenal ulcer (5 of 26). Normal serum iron levels (80 to 150 μg%) were found in 30%, and subnormal levels (less than 80 μg%) in 70% of the patients, postoperatively. After 6 months, normal serum iron levels were found in 48%, subnormal levels in 39% and high levels (more than 150 μg%) in 13%. After one year the corresponding levels were 45, 42 and 13%, and after 18 months, 50, 43 and 7%. After gastric surgery the pattern of serum iron levels gradually becomes that of pernicious anemia. All gastric surgery patients should be kept under postoperative observation so that vitamin B_{12} and iron can be supplemented at the most favorable time.

1858 ACUTE AFFERENT LOOP SYNDROME SIMULATING ACUTE PANCREATITIS. *(E.)* Port, M. (New York Polyclin. Hosp., N. Y.) and A. Gelb. *Amer J Gastroent* 53(1):36-40, 1970.

A case report of acute afferent loop syndrome simulating acute pancreatitis is described in a 43-year old female. Twisting and necrosis of the afferent loop occurred 14 months after gastrectomy and immediately after an upper gastrointestinal series which showed a normal afferent loop. Diagnosis of acute pancreatitis was made on the basis of elevated serum and peritoneal amylase and normal upper gastrointestinal series prior to admission and pancreatic inflammation noted at the time of gastrectomy supported the diagnosis. The twisting may have been caused by barium. Surgery was not performed and the patient died. Surgical treatment is indicated since complete obstruction of the afferent loop is fatal. The possibility of acute afferent loop syndrome may exist in a patient with prior gastric surgery and laparotomy is suggested in doubtful cases.

1859 HYPERTROPHIC, HYPERSECRETORY PROTEIN-LOSING GASTROPATHY. *(E.)* Overholt, B. F. (New York Hosp., Cornell Med. Ctr., New York) and G. H. Jefferies. *Gastroenterology* 58(1):80-87, 1970.

A 50-yr-old white male with the clinical manifestations of hypoproteinemia and in whom gastric hyperrugosity was associated with excessive gastric protein loss and acid hypersecretion is discussed. Atropine sulfate (1 mg i.v.) markedly reduced both the hypersecretion and gastric protein loss. Basal gastric volume and acid output were high, but acid concentration was normal; histalog (1.5 mg/kg of true weight) stimulation significantly increased all three parameters. During the collection of basal gastric secretion, a large protein loss into the stomach was found as indicated by ^{51}Cr-albumin clearance studies. Anticholinergic therapy should be considered in any patient with a protein-losing gastropathy of nonmalignant etiology.

1860 GIANT THICKENING OF THE GASTRIC MUCOSA WITH ACID HYPERSECRETION AND PROTEIN-LOSING GASTROPATHY. *(E.)* Brooks, A. M. (VA Ctr., Los Angeles, Calif.), J. Isenberg and H. Goldstein. *Gastroent* 58(1):73-78, 1970.

A cast of giant thickening of the gastric mucosa and marked protein loss from the stomach (as in Menetrier's disease) was reported in a 46-yr-old Negro male. There was marked gastric hypersection of acid and pepsin (in contrast to the gastric hyposecretion in Menetrier's disease) and *in vivo* labeling of plasma proteins with $^{51}CrCl_2$ revealed a gastrointestinal protein clearance about 36x normal due to protein exudation from the stomach. Histologically, the stomach showed a mixture of hyperplasia of oxyntic and zymogen cells with cystic degeneration. Chronic abdominal discomfort and recurrent gastrointestinal bleeding eventually required total gastrectomy.

1861 PATHOLOGICAL STUDY OF METASTATIC INVOLVEMENT OF THE STOMACH CANCER III. *(E.)* Yamagiwa, H. (Mie Perfectural U. Sch. Med., Tsu, Japan). *Mie Med* 18(3):173-182, 1969.

1862 PAIN IN GASTRITIS: EXPERIMENTAL STUDY. *(E.)* Necheles, H. (Michael Reese Hosp. Med. Ctr., Chicago, Ill.) and M. Maskin. *Amer J Gastroent* 53(1):62-71, 1970.

1863 EVOLUTION OF THE VAGOTOMIZED STOMACH. *(Fr.)* Rovati, V. (no affil) and A. Bastagli. *Mem Acad Chir* 95(24-25):721-724, 1969.

1864 TOPOGRAPHICAL VARIATIONS IN AMPULLARY LOCATION IN THE DUODENUM: SURGICAL CONSEQUENCES. *(Fr.)* Pedinielli, L. (Toulon, France), A. Ponthieu and S. Silven. *J Chir* 98(4):413-418, 1969.

1865 GASTRIC PSEUDOLYMPHOMA (LYMPHOFOLLICULAR GASTRITIS). *(E.)* Watson, R. J. (Letterman Gen. Hosp., San Francisco, Calif.) and M. T. O'Brien. *Ann Surg* 171(1):98-106, 1970.

1866 RAYNAUD'S PHENOMENON, PYLORIC OBSTRUCTION AND ANEMIA. *(E.)* Isselbacher, K. J. (Massachusetts Gen. Hosp., Boston) and B. Castleman. *New Eng J Med* 282(4):211-219, 1970.

867 MODIFICATIONS OF THE BILIARY TREE IN GASTRIC RESECTED PATIENTS THROUGH ADDITIONAL URGERY AND NUTRITIONAL SYNDROMES. *(It.)* Broglia, . (Hosp. Central, Rome, Italy), A. Dell'osso, P. alatesta, G. Misiti and B. Sbuelz. *Chir Gastroent* (supp 1):76-84, 1968.

868 A STUDY OF PLASMINOGEN ACTIVATOR AND TRYPSIN INHIBITOR IN GASTRIC CANCER, ULCER AND XPERIMENTAL TUMOR. *(Jap.)* Tsuchiya, T. (Sch. Med., oho U., Japan). *Arch Jap Chir* 38(5):760-776, 1969.

869 FRACTIONAL DUODENAL DRAINAGE AFTER TRANSDUODENAL SPHINCTEROTOMY. *(It.)* Teofili, . T. (Inst. Clin. Surg. Surg. Ther., U. Rome, taly). *Epatologia* 14(6):545-556, 1968.

870 GASTROENTERITIS IN INFANCY AND CHILDHOOD. *(E.)* Hoh, T. K. (Gen. Hosp., Singapore) nd T. C. Lim. *J Singapore Paediat Soc* 1(2):119-125, 1969.

871 PYLORIC STENOSIS IN THE RACIAL GROUPS OF HAWAII. *(E.)* Shim, W. K. T. (Kauikeolani hild. Hosp., Honolulu, Hawaii), A. Campbell and . W. Wright. *J Pediat* 76(1):89-93, 1970.

872 AFFERENT-LOOP OBSTRUCTION MIMICKING ACUTE PANCREATITIS. *(E.)* Everett, W. G. (Addenrooke's Hosp., Cambridge, England) and D. Sampson. *rit J Surg* 56(11):843-844, 1969.

873 INFLUENCE OF GASTRECTOMY ON LEUCOCYTES IN BLOOD DURING EXERCISE IN TUBERCULOUS PATIENTS. *(E.)* Hanngren A. (Soderby Hosp., Uttran, weden) and T. Strandell. *Acta Med Scand* 86(6):505-509, 1969.

874 ACUTE SYMMETRIC ULCERATION OF THE ANTRAL PORTION OF THE STOMACH -- A NEW CONCEPT F HEMORRHAGIC EROSION AND ACUTE ULCERATION DUE TO HE SPASM OF THE ANTRUM. *(Jap.)* Takagi, K. (no ffil), K. Kumakura, M. Maruyama, H. Sugano, K. akamura, D. Aoyama, H. Ishimoto and C. Onishi. *ap J Cancer Clin* 15(10):887-896, 1969.

875 MEASUREMENTS OF GASTRIC ACIDITY IN THE CLINICO-SURGICAL EVALUATION OF GASTRO-UODENAL ULCER. *(Sp.)* Mena, L. G. (Med. Fac. Central U., Quito, Ecuador). *Rev Ecuat Med Cienc Biol* 7(2):136-142, 1969.

1876 PATHOPHYSIOLOGY OF POST-GASTRECTOMY HYPOGLYCEMIA. *(E.)* Holdsworth, C. D. (St. Bartholomew's Hosp., London, England), D. Turner and N. McIntyre. *Brit Med J* 4(5678):257-259, 1969.

1877 COMPLICATIONS OF TOTAL GASTRECTOMY. *(E.)* Sanchez, R. E. (Wadsworth Hosp., VA Ctr., Los Angeles, California) and H. E. Gordon. *Arch Surg* 100(2):136-139, 1970.

1878 ECTOPIC SPLEEN MIMICKING AN INTRINSIC FUNDAL LESION OF THE STOMACH. *(E.)* Font, R. G. (Tulane U. Sch. Med., New Orleans, La.), R. D. Sparks and G. A. Herbert. *Amer J Dig Dis* 15(1):49-56, 1970.

1879 THE IMPLICATIONS OF BILE IN THE STOMACH. *(E.)* Cole, G. J. (no affil). *Gut* 10(10):864-867, 1969.

1880 PATHOLOGICAL STUDY OF METASTATIC INVOLVEMENT OF THE STOMACH CANCER IV. HISTOGENESIS AND DEVELOPMENT. *(E.)* Yamagiwa, H. (Mie Prefectural U. Sch. Med., Tsu, Japan). *Mie Med* 18(3):183-194, 1969.

1881 A CASE OF URETERO-DUODENAL FISTULA. *(Fr.)* Devlesaver, P. (U. Urology, Brussels, Belgium). *Acta Urol Belg* 37(4):431-433, 1969.

1882 NEUROLOGICAL SEQUELAE OF PARTIAL GASTRECTOMY. *(E.)* anon. *Brit Med J* 4(5685):702-703, 1969.

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1884 CHRONIC GASTRITIS: CLINICAL AND THERAPEUTIC OUTLINE. *(Fr.)* Frumusan, P. (Hosp. St. Antoine, Paris, France). *Monde Med* 79(1054):1620-1624, 1969.

1885 RELATIONSHIP BETWEEN STOMACH DISORDERS AND CANCER OF THE LIP. *(It.)* Valenzano, G. (Dermatol. Inst. St. Maria and St. Gallicano, Italy) and V. Testa. *Policlinico* 76(47)1533-1534, 1969.

1886 ABSORPTION OF FAT FOLLOWING GASTRIC RESECTION. *(Jap.)* Shimazu, E. (Gifu U. Sch. Med., Japan), K. Murase, M. Ando, K. Kaya, H. Inagaki, S. Yamaguchi, T. Yoshida, J. Hayashi and Y. Watanabe. *Arch Jap Chir* 38(5):788-794, 1969.

1887 EXUDATIVE GASTROPATHY WITH HYPOPROTEINEMIA DUE TO A MALIGNANT TUMOR OF VILLOUS STRUCTURE: AN ARTERIOGRAPHIC AND BIOLOGICAL STUDY - CURE BY GASTRECTOMY. *(Fr.)* Debray, C. (Paris, France), M. Cerf, L. Barsamian, C. Marche, B. Gouin, P. Housset and V. Lafon. *Arch Franc Mal Appar Dig* 58(10-11):661-674, 1969.

1888 THE PREVENTION AND TREATMENT OF GASTROENTERITIS IN INFANCY. *(E.)* Holzel, A. (Booth Hall Child. Hosp., Manchester, England). *Practitioner* 204(1219):46-54, 1970.

1889 ACUTE SUPERIOR MESENTERIC ARTERY SYNDROME. *(E.)* Mindell, H. J. (Med. Ctr. Hosp. Vermont, Burlington) and J. L. Holm. *Radiology* 94(2):299-302, 1970.

1890 PROBLEMS IN THE TREATMENT OF PRIMARY DUODENAL CARCINOMA. *(It.)* Scultetus, R. (Hosp. St. Maria Nuova, Firenze, Italy), C. Massimo, F. Petrucci and P. Favi. *Osped Ital Chir* 18(3)243-248, 1968.

1891 DUODENAL CARCINOMA WITH POLYPOID ASPECT. *(It.)* Perna, A. M. (Inst. Path. Spec., U. Firenze, Italy) and R. Francini. *Osped Ital Chir* 18(3):237-242, 1968.

1892 THE BRUNNER ADENOMA OF THE DUODENUM: CASE REPORT. *(It.)* Natale, C. (Hosp. Central, Foggia, Italy) and E. Perrotti. *Osped Ital Chir* 18(3):229-236, 1968.

1893 INHERITANCE OF CONGENITAL PYLORIC STENOSIS. *(E.)* anon. *Med J Aust* 56(23):1122-1123, 1969.

1894 GASTRIC RETICULOSARCOMA. *(Fr.)* Meignie, P. (no affil), M. Heraud and J. Leduc. *Lille Med* 14(9):1036-1038, 1969.

1895 DUODENAL RUPTURE CAUSED BY NON-PENETRATING TRAUMA. *(Fr.)* Louyest, J. (Inst. Notre Dame de la Compassion, Fayt-lez-Manage, Belgium) and H. A. J. Lemmens. *Louvain Med* 88(9):721-727, 1969.

1896 GASTRIC CANCER. *(Sp.)* Peirano, D. (Hosp. Carlos Van Buren, Valparaiso, Chile), S. Watt, H. Apablaza and O. Chapsal. *Rev Med Valparaiso* 22(4):206-210, 1969.

1897 GASTRIC CANCER (YEARS 1964-1968). *(Sp.)* Flores, N. (Hosp. J. J. Aguirre, Valparaiso, Chile), K. Bernhardt, E. Villarroel and L. Cortes. *Rev Med Valparaiso* 22(4):197-201, 1969.

1898 PRIMARY CARCINOMA OF THE DUODENUM. *(Sp.)* Mogena, H. G. (Jimenez Diaz Found., Madrid, Spain), C. Gonzalez Campos and H. Oliva Aldamiz. *Rev Esp Enferm Apar Dig* 29(4):485-498, 1969.

1899 ABSORPTION OF ETHIONAMID, ISONIAZID, AND AMINOSALICYLIC ACID FROM THE POST-RESECTION GASTROINTESTINAL TRACT. *(E.)* Mattila, M. J. (Dept. Pharmacol., U. Helsinki, Finland), A. Friman, T. K. I. Larmi and R. Koskinen. *Ann Med Exp Biol Fenn* 47(3):209-212, 1969.

- P:Morph (1576)(1621)
- P:Absorp (1625)
- P:Motil (1649)(1660)(1661)
- P:Secr:Stom (1678)(1680)
- Diagproc (1800)(1802)(1804)(1823)
- D:Esoph (1827)(1828)(1847)(1849)(1853)
- D:Stomduo:Peptulc (1900)(1901)(1902)(1909)(1910)(1916)
- D:S.Intest (1956)
- D:Pancreas (2017)(2025)
- D:Livbil:Gallb (2166)
- D:Gen (2221)

00 DISTAL ANTRECTOMY FOR DUODENAL ULCER:
SIXTEEN-YEAR REVIEW OF OUR RESULTS IN
0 CASES. *(E.)* Palumbo, L. T. (VA Hosp. Des
ines, Iowa), W. S. Sharpe, D. J. Lulu, M. H.
oom and L. R. Dragstedt, II. *Arch Surg* 100(2):
2-190, 1970.

sixteen-year review of results of distal antrec-
omy with vagectomy for 510 cases of duodenal ulcer
presented. The operation consisted of a distal
ntrectomy with 25% or less distal gastric resec-
ion, with bilateral truncal vagectomy, Billroth 2,
ticolic gastrojejunostomy, and short afferent
ejunal limb. This procedure controls the neuro-
enic or cephalic-gastric vagal pathways of gastric
cid stimulation. In follow-up studies for 452 of
e 496 patients who survived, most of these pa-
ients were able to maintain themselves on three
ll meals per day with no moderate to severe die-
ry restrictions. Twenty-one percent gained
eight, 61.7% maintained their preoperative weight,
d weight loss occurred in 17.5%. Moderate or
evere dumping syndrome occurred infrequently and
iarrhea was recurrent or troublesome in only 3.3%
the patients. The overall evaluation of the
esults in 450 patients was considered good to ex-
ellent in 90% of the patients.

01 THE EFFECTS OF SELECTIVE VAGOTOMY PLUS
SUPRAPYLORIC ANTRECTOMY UPON GASTRIC
OTILITY AND HEIDENHAIN POUCH SECRETION. *(E.)*
verett, M. T. (United Cardiff Hosp., Wales) and
. A. Griffith. *Ann Surg* 171(1):36-41, 1970.

he effect of selective vagotomy with a suprapyloric
ntrectomy were studied in 8 adult mongrel dogs
four had Heidenhain pouches). Selective vagotomy
as done by transection of the gastric vagi at the
evel of most distral esophagus and gastric cardia,
hile preserving the hepatic and celiac vagi. All
ogs remained in good health during the 8-week
ost-operative period of study. Weight loss in
nimals with pouches amounted to 25% of total body
eight, while weight loss in dogs without pouches
as minimal. In dogs with 2 cm or less of distal
ntral remnant, there was no gastric stasis and a
ecrease in pouch secretion. In dogs with more
han 2 cm of distal antrum, gastric stasis occurred
nd pouch secretion increased. The clinical appli-
ation of selective vagotomy with suprapyloric
ntrectomy with a 1.5 cm antral remnant is con-
idered as a control of the diathesis of duodenal
lcer without production of a dumping syndrome.

02 INCIDENCE OF DIARRHEA AFTER VAGOTOMY AND
ASSOCIATED GASTRIC OPERATION. *(Ital.)*
recchia, C. (Pio Inst. S. Spirito, Rome, Italy),
. Sbuelz and P. Malatesta. *Chir Gastroent* 2(Supp.
):39-48, 1968.

urgical intervention for gastroduodenal ulcers in
20 patients included antrectomy, pyloroplasty and
astroenterostomy in combination with different
ypes of vagotomy. Periodic follow-ups of these
atients at 3-month intervals showed that the inci-
ence of postoperative diarrhea was 1% with total
selective vagotomy, 6.1% with selective anterior truncal posterior vagotomy and 10.7% after total truncal vagotomy. Of the surgical procedures, pyloroplasty was associated with the lowest and antrectomy (Billroth II) with the highest incidence of diarrhea. Best results were obtained by combination of selective vagotomy and pyloroplasty and this was attributed to the preservation of extragastric parasympathetic innervation.

1903 GASTRIC ANTRO-FUNDAL DEMARCATION (PERSONAL EXPERIENCES WITH COLORIMETRIC AND pHMETRIC METHODS. *(Ital.)* Orecchia, C. (Pio Ist. S. Spirito, Rome, Italy), B. Sbuelz and M. Marzi. *Chir Gastroent* 2(supp. 1)3-11, 1968.

To compensate for the individual variations in the extent of the gastric antrum (particularly along the lesser curvature) which frequently jeopardize the results of antrectomy, staining with Congo red or pH determination by glass electrode were used intrasurgically to pinpoint antral proportions in 48 patients with duodenal and gastric ulcers. Histamine dihydrochloride was administered prior to gastroduodenotomy to stimulate gastric secretion and facilitate distinction. A fine sheet of gauze placed over the gastric mucosa and saturated with Congo red turned bluish-black in the area that corresponded to acid secreting mucosa but remained distinctly red over the zone of the antrum. Measurements of pH by electrode gave similar results as judged by the abrupt fall in mucosal pH from 6.5-5.5 to 3.5-2.8 indicating the transition from antrum to corpus ventriculi. The resulting demarcation line corresponded to that observed with Congo red. Using either method it was demonstrated that the antral portion of the stomach is larger in patients with gastric ulcers than in those with duodenal ulcers.

1904 THE LATEST CONCEPTS IN SURGICAL MANAGEMENT OF PEPTIC ULCER DISEASE. *(E.)* Moody, F. G. (U. Alabama Med. Coll., Birmingham). *J Alabama Med Ass* 39(5):464-468, 1969.

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1907 THE PLACE OF VAGOTOMY AND DRAINAGE IN THE TREATMENT OF DUODENAL ULCER. *(Fr.)* Schneiter, R. (Contonal Hosp., Geneve, Switzerland. *Rev Med Suisse Rom* 89(11):1021-1032, 1969.

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1909 SARCOMA OF THE STOMACH AFTER GASTRIC RESECTION FOR ULCER. *(It.)* Misiti, G. (Hosp. Central, Rome, Italy), B. Sbuelz, A. Dell'osso and C. Orecchia. *Chir Gastroent* 2(supp 1):120-129, 1968.

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1911 STRESS ULCER. *(It.)* Orecchia, C. (Hosp. Central, Rome, Italy), S. Broglia and G. Misiti. *Chir Gastroent* 2(supp 1):157-168, 1968.

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1913 STRESS ULCERS: A CLINICAL AND EXPERIMENTAL STUDY SHOWING THE ROLES OF MUCOSAL SUSCEPTIBILITY AND HYPERSECRETION. *(E.)* Douglass, H. O., Jr. (VA Hosp., Brooklyn, N. Y.) and H. H. LeVeen. *Arch Surg* 100(2):178-181, 1970.

1914 A HALF CENTURY OF PERSONAL EXPERIENCE IN GASTRIC SURGERY. *(E.)* Strauss, A. A. (Michael Reese Hosp. Med. Ctr., Chicago, Ill.). *Bull Mason Clin* 23(4):168-178, 1969.

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1917 93 OBSERVATIONS OF POST-OPERATIVE PEPTIC ULCERS. *(Fr.)* Lagache, G. (no affil), B. Combemale, C. Proyle, M. Vankemmel and G. Depadt. *Lille Med* 14(9):1021-1026, 1969.

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◎ P:Motil (1661)
◎ Diagproc (1800)
● D:Stomduo (1857)(1868)

1925 ASSESSMENT OF DIETS AFTER SMALL-BOWEL RESECTION IN THE RAT. *(E.)* Wapnick, S.
Roy. Postgrad. Med. Sch., London, England), P.
ukerjee and A. G. Cox. *Brit J Surg* 56(11):828-831,
969.

our diets (low protein, high fat; high protein,
ow fat; high protein, high unsaturated fat; high
rotein, high saturated fat) were fed for 10 days
o 16 rats who had undergone (3 weeks previously)
esection of the small intestine and to 16 control
ats. Weight loss occurred in all resected rats
egardless of diet but occurred in only those con-
rol rats fed a low protein, high fat diet. In the
esected rats the groups fed high protein-high fat
iet showed less weight loss and higher carcass
itrogen values than the resected rats fed low
rotein-high fat and high protein-low fat diets.
he Net protein utilization (calculated as the
ercentage ratio of retained nitrogen to intake
itrogen) was significantly higher in control rats
n high protein-low fat and on high protein-high
nsaturated fat diets than in the resected rats
ed the same diets.

926 MECONIUM ILEUS RELIEVED BY 40 PER CENT WATER-SOLUBLE CONTRAST ENEMAS. *(E.)*
rech, R. S. (Washington U. Sch. Med., St. Louis,
o.), W. H. McAlister, J. Ternberg and D. Strominger.
adiology 94(2):341-342, 1970.

successful non-surgical treatment for uncompli-
ated meconium ileus is described in which sodium
iatriazoate (40 per cent Hypaque) enemas are re-
luxed under fluoroscopy to the area of the meconium
lug. Loose meconium stools are passed until all
econium plugs are gone and the ileus is relieved,
hile hydration and electrolyte balance are main-
ained with intravenous fluids.

927 BACTERIOLOGICAL PROBLEMS ARISING FROM AN ILEO-JEJUNO-COLIC TRANSPLANT. *(Fr.)*
erbal, R. (Surg. Clin. Hotel-Dieu, Paris, France),
. L. Loiseau-Marolleau, R. Fasquelle and Ch.
livier. *J Chir* 98(4):357-364, 1969.

928 ORTHOTOPIC HOMOTRANSPLANTATION OF THE SMALL INTESTINE AND THE RIGHT AND TRANS-
ERSE COLONS IN A MAN. *(Fr.)* Olivier, Cl. (Surg.
lin. Hotel-Dieu, Paris, France), R. Rettori, Ch.
livier, O. Baur and J. Roux. *J Chir* 98(4):323-330,
969.

929 STUDY OF THE DIGESTIVE PHYSIOLOGY DURING AN ILEO-JEJUNO-COLIC HOMOTRANSPLANT. *(Fr.)*
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autier, Badriamanana and Ch. Olivier. *J Chir*
8(4):365-370, 1969.

930 IATROGENIC INTESTINAL ULCER: A CASE REPORT. *(Sp.)* Villalobos, J. de J. (Natl.
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1932 PRIMARY MALIGNANT LYMPHOMA OF SMALL INTESTINE. RESULTS OF TREATMENT. *(E.)* Cupps, R. E. (Mayo Clin., Rochester, Minn.), M. B. Dockerty and M. A. Adson. *Minn Med* 52(12):1865-1971, 1969.

1933 MELANOSIS OF THE ILEUM: CASE REPORT AND ELECTRON MICROSCOPIC STUDY. *(E.)* Ramchand, S. (Kingston Gen. Hosp., Queen's U., Ontario, Canada) and K. H. Won. *Amer J Dig Dis* 15(1):57-64, 1970.

1934 A CLINICAL, ANATOMICAL, AND BIOLOGICAL STUDY OF TWO OBSERVATIONS OF CARCINOID SYNDROME ACCOMPANYING A TUMOR OF THE MECKEL'S DIVERTICULUM AND AN ILEAL TUMOR. *(Fr.)* Derot, M. (Dept. Diabetes, Metabol. Dis., Hotel-Dieu, Paris, France), P. Freychet, A. Castel, V. N. Cahn, J. P. Camilleri and J. F. Fournial. *Ann Med Intern* 120(11):729-738, 1969.

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1941 GALLSTONE ILEUS. *(E.)* Andersson, A. (Dept. Surg. I., U. Goteborg, Sweden) and B. Zederfelt. *Acta Chir Scand* 135(8):713-717, 1969.

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1945 PRIMARY MALIGNANT TUMOR OF THE JEJUNUM. *(E.)* Maxam, B. T. (Indianapolis, Indiana). *J Indiana Med Ass* 62(12):1398-1400, 1969.

1946 LEIOMYOSARCOMA OF TESTIS AND SMALL BOWEL. *(E.)* LeNoach, P. M. (Eastern Maine Med. Ctr., Bangor). *J Maine Med Ass* 60(12):270-274, 1969.

1947 ACUTE ALLERGIC SEGMENTAL ENTEROPATHY. *(Fr.)* Fassio, M. E. (no affil). *Arch Franc Mal Appar Dig* 58(10-11):689-700, 1969.

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1950 THE EFFECT OF INTESTINAL OBSTRUCTION ON LIVER MICROSOMAL ENZYMES IN RATS: WITH SPECIAL REFERENCE TO CHANGES OF HEXOBARBITAL, CHLORPROMAZINE AND PETHIDINE METABOLIZING MICROSOMAL ENZYMES *IN VITRO*. *(E.)* Kaltiala, E. H. (Dept. Pharmacol., U. Oulu, Finland). *Acta Chir Scand* (supp 402):1-80, 1969.

1951 ANATOMICAL AND PATHOLOGICAL STUDY OF A CASE OF JEJUNO-ILEO-COLIC HOMOTRANSPLANT IN A MAN. *(Fr.)* Camilleri, J. P. (Surg. Clin. Hotel-Dieu, Paris, France), J. Diebold, M. Reynes, C. Olivier and J. Delarue. *J Chir* 98(4):371-384, 1969.

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1956 PAPILLOTOMIES AND TRANSDUODENAL SPHINCTEROTOMIES: WITH REFERENCE TO 136 CASES. *(Fr.)* Barsotti, J. (Paris, France), J. Greco, L. Castellani and H. Larrieu. *Bull Soc Chir Paris* 59(4):187-219, 1969.

1957 RUPTURED ILEUM WITH PERITONITIS FOLLOWING BLUNT TRAUMA TO INGUINAL HERNIA: A REPORT OF TWO CASES AND REVIEW OF THE LITERATURE. *(E.)* Tornilla, M. J., Jr. (Appalachian Reg. Hosp., Beckley, West Virginia). *West Virginia Med J* 66(1):6-8, 1970.

- Diagproc (1804)
- D:Stomduo (1870)
- D:Stomduo:Peptulc (1900)
- D:L.Intest (1970)(2001)
- D:Gen (2190)(2221)

958 RADIOLOGIC SIGNIFICANCE OF PRIMARY ENTEROLITHIASIS. *(E.)* Brettner, A. (Upstate ed. Ctr., Syracuse, N. Y.) and E. J. Euphrat. *Ra-iology* 94(2):283-288, 1970.

959 REGIONAL ENTERITIS. EARLY DIAGNOSIS. *(E.)* Gordon, S. S. (St. Louis Park Med. Ctr., Minn.). *Minn Med* 52(12):1873-1879, 1969.

1960 REGIONAL ENTERITIS LEADING TO CARCINOMA OF THE SMALL BOWEL. *(E.)* Wyatt, A. P. (Mem. Hosp., Woolwich, London, England). *Gut* 10(11):924-927, 1969.

1961 POST-PRANDIAL PLASMA-FREE AMINO ACIDS IN ADULT COELIAC DISEASE AFTER ORAL GLUTEN AND ALBUMIN. *(E.)* Douglas, A. P. (Roy. Postgrad. Med. Sch., London, England) and C. C. Booth. *Clin Sci* 37(3):643-653, 1969.

Plasma-free amino acids were measured before and at different time intervals after feeding wheat gluten to six patients with untreated adult coeliac disease, to five patients with adult coeliac disease who had been successfully treated with a gluten-free diet and to nine control subjects. For comparison, the studies were repeated in three untreated patients, three treated patients and four control subjects after an oral test dose of albumin. The fasting plasma levels of free amino acids in the patient with untreated coeliac disease were lower than in the control subjects and there were no differences between the control subjects and the patients with treated coeliac disease. After gluten feeding, the increase above fasting of plasma amino acids was consistently greater in the untreated patients than in either of the other two groups. Similar results were found with the albumin feeding studies. Gluten digestion does not appear to be specifically impaired in patients with adult coeliac disease.

1962 IMMUNOGLOBULINS IN SERUM AND JEJUNAL BIOPSIES IN NON-TROPICAL SPRUE. *(E.)* Soltoft, J. (St. Hosp. Copenhagen, Denmark) and B. Weeke. *Acta Med Scand* 186(5):459-464, 1969.

Immunochemical determinations of serum immunoglobulins (IgG, IgA, IgM) were carried out before and during treatment with a gluten-free diet in 12 patients with non-tropical sprue. Fluorescent antisera specifically reacting with IgG, IgA and IgM were applied to jejunal biopsies from these patients and the cells containing these immunoglobulins were differentiated and quantitated. Serum IgM levels, which were decreased in untreated patients, were normal (0.56 g/l) in treated patients. In both treated and untreated patients, serum IgA and IgG levels were increased above normal (1.50 g/l and 10.4 g/l, resp.). There was no correlation between serum immunoglobulin levels and the area of the corresponding immunoglobulin containing cells in the jejunum.

1963 THE NET ABSORPTION OF THE AMINO ACID CONSTITUENTS OF A PROTEIN MEAL IN NORMAL AND CYSTINURIC SUBJECTS. *(E.)* Mawer, G. E. (Dept. Ther., U. Edinburgh, Scotland) and E. Nixon. *Clin Sci* 36(3):463-477, 1969.

The net absorption of each of 17 amino acids (fed in a physiological form as a 15g milk protein meal) was estimated after the analysis of intestinal residues in two cystinuric patients and normal controls. Samples were drawn from various areas of the small intestine for three hr after the feeding. In the controls and cystinuric patients, the acidic and neutral amino acid components of the intestinal contents after the meal were removed relatively rapidly from the duodenum and upper jejunum and rapid removal from the upper jejunum was also observed for the basic amino acids and cystine in the controls. Absorption was less rapid as the meal passed along the intestinal tract and at 250 cm from the nose, absorption had reached 70 to 80% for twelve amino acids. In the cystinuric patients, the net absorption of lysine was reduced markedly, there was no consistent evidence for the net absorption of cystine or arginine, the concentrations of free lysine, arginine and cystine were increased to more than twice the highest levels noted in the controls, and the concentrations of peptide linked lysine and arginine were not increased. Free phenylalanine and tyrosine concentrations in the cystinurics were consistently higher than the upper limits of the control ranges (this may be due to partial inhibition of active transport by high free lysine concentrations).

1964 MALABSORPTION OF LACTOSE IN GASTRIC OPERATIONS. *(Fr.)* Gudmand-Hoyer, E. (Rigshospitalet, Copenhagen, Denmark). *Rev Med Suisse Rom* 89(11):1049-1054, 1969.

1965 PRECIPITINS TO AQUEOUS EXTRACTS OF FLOUR IN CELIAC DISEASE. *(E.)* Rossipal, E. (U. Dept. Pediat., Graz, Austria). *Lancet 1* (7640):251-252, 1970.

1966 ADULT CELIAC DISEASE IN HYPOSPLENIC PATIENTS. *(E.)* Ferguson, A. (Roy. Infirm., Glasgow, Scotland), M. M. Hutton, J. D. Maxwell and D. Murray. *Lancet 1* (7639):163-164, 1970.

1967 CHRONIC MALABSORPTION (STEATORRHEA, NON-TROPICAL SPRUE) IN AN ADOLESCENT, WITH DEATH FROM MALIGNANT LYMPHOMA, HISTIOCYTIC TYPE (RETICULUM CELL SARCOMA). *(E.)* Huntington, R. W., Jr. (Kern County Gen. Hosp., Bakersfield, Cal.), T. E. Larwood, F. Armstrong, S. Palitz, D. Hance and I. Moses. *Cancer* 25(1):206-211, 1970.

- P:Absorp (1624)
- P:Secr:Stom (1699)
- D:Gen (2194)

68 ANALYSIS OF 860 PATIENTS WITH CARCINOMA OF THE TRANSVERSE AND DESCENDING COLON.
E.) Speck, R. L. (Yale U. Sch. Med., New Haven, onn.), W. H. Thomas, R. A. Larson, H. K. Wright nd J. C. Cleveland. *Surg Gynec Obstet* 130(2): 59-262, 1970.

o evaluate therapy results, 860 cases of adenocarinoma of the transverse and descending colon (30 yr eriod) were analyzed. Prognosis was related to the nterval of symptoms prior to therapy, primary sympoms, and to pathological staging. Most cases were iagnosed during the seventh decade of life. The 5 r survival rate was lowest in patients who preented as emergencies and in patients with symptoms rising from acute or chronic obstruction. The perative mortality rate for those with lesions of he transverse colon was 21% from 1931 to 1940, 11% rom 1941-1950 and 8% from 1951-1960. For lesions f the descending colon, mortality rates were 14, .3 and 6.5% for the respective periods. The overll survival rate for the last decade (1950-1960) as 34%, with recurrences at the suture line occurring in 13% of the patients who underwent resection. need for early diagnosis and careful operative echnique is indicated.

969 TUMOR AND HOST CALCIUM IN HUMAN COLON CARCINOMA. *(E.)* Fisher, B. (U. Pittsburgh Sch. Med., Pa.), E. Saffer and E. R. Fisher. *Cancer* 25(1):41-44, 1970.

The calcium content of adenocarcinomas of the colon and of adjacent normal colonic tissue was determined by atomic absorption spectrophotometry following colonic resection in 25 patients. Calcium content of the adenocarcinomas was related to lymph node involvement and tumor invasiveness (as characterized by Dukes' classification). The average calcium content of the adenocarcinomas was 11.96 ± 5.82 mg/100 ml and that of adjacent normal colonic mucosa was 12.03 ± 2.85 mg/100 ml (difference not statistically significant). There was no correlation between tumor and mucosal calcium of patients with tumor-positive or tumor-negative lymph nodes (in the resected specimen) and between tumor and mucosa calcium content in patients classified as having invasive tumors. Data do not support the hypothesis that local invasiveness and distant spread of tumors is result of decreased adhesiveness of cancer cells due to the lowered calcium content.

1970 COMPLETE REFLUX OF THE SMALL BOWEL IN TOTAL COLON HIRSCHSPRUNG'S DISEASE. *(E.)*
Chandler, N. W. (Emory U. Sch. Med., Atlanta, Ga.) and G. T. Zwiren. *Radiology* 94(2):335-339, 1970.

Two of 3 neonatal infants with total colon aganglionosis demonstrated retrograde filling of the entire small bowel and stomach following barium enema examination. In both cases normal amounts of barium were used, and no attempt was made to reflux into the small intestine. The characteristic findings in all 3 cases included poor feeding or vomiting, moderate distension of the small bowel, an essentially normal colon appearance (on barium enema examination) and a patent ileum.

1971 SOLITARY ULCER OF THE RECTUM. *(E.)*
Madigan, M. R. (St. Mark's Hosp., London, England) and B. C. Morson. *Gut* 10(11):871-881, 1969.

The clinical features, pathology, treatment and behavior of 68 patients with solitary ulcer of the rectum are reported. The condition was most common among young adults but was not related to social or family history. Bleeding on defecation was noted in 91% of the patients. Digital examination of the rectum was normal in 35% while sigmoidoscopy disclosed a single ulcer in 70% and 2 or more ulcers in 30%. The ulcers were found in the anterior wall of the rectum in 26% and the anterio-lateral wall in 21% (most were found 7-10 cm from the anal margin). Other anorectal disease was found in 48% of the patients. The ulcers did not respond satisfactorally to surgical, pharmacologic or other forms of medical treatment. There is a nonulcerated stage of the disease in which the biopsy appearances are similar to those of the ulcerative stage. Rectal biopsy in patients with solitary ulcer commonly showed replacement of the normal lamina propria by fibro-muscular tissue from the muscularis mucosae, reactive hyperplasia in the mucosal epithelium, goblet cell depletion, cystic dilation of the tubules and superficial erosion of the mucous membrane. The condition is essentially benign, may persist unchanged for many years and may regress spontaneously. The etiology of solitary ulcer is unknown.

1972 RIFAMPICIN IN THE TREATMENT OF SALMONELLOSIS. *(It.)* Toscano, F. Major Hosp. Carita, Novara, Italy) and P. T. Ricciardiello. *Minerva Med* 60(96):4790-4792, 1969.

Rifampicin was used in the treatment of 21 cases of salmonellosis caused by Salmonella typhosa (4 patients), S. infantum (12 patients), S. paratyphi B (3 patients) and S. typhimurium (2 patients). Mean daily doses of 30-40 mg/kg in adults and 25 mg/kg in children were administered for a minimum of 7 to a maximum of 20 days. Adequate therapeutic response was obtained in all but 2 patients. There were no side effects and no changes in antibody levels. Rifampicin, although active against minor and major salmonelloses at high doses, is no equivalent substitute for chloramphenicol, but may be a useful alternative in cases of intolerance to the latter.

1973 RIFAMPICIN IN SALMONELLOSIS. *(It.)*
Di Nola, F. (Hosp. Amedeo Savoia, Torino, Italy and M. R. Salassa. *Minerva Med* 60(96):4796-4802, 1969.

The activity of rifampicin against 27 enteral microorganisms including different strains of Salmonella typhosa and S. paratyphi A and B was compared *in vitro* with that of ampicillin and chloramphenicol. Rifampicin had no inhibitory effect at concentrations below 1.0 mcg/0.05 ml but was slightly to moderately active at 10 mcg/0.05 ml. Ampicillin and particularly chloramphenicol displayed potent inhibitory activity at concentrations ranging between 1.0 and 10 mcg/0.05 ml. In a subsequent clinical trial, rifampicin, 900 mg/day, was administered to 15 patients in whom salmonellosis had been confirmed by positive Widal reaction. Seven patients responded favorably to the drug and recovered fully after total doses of 6.6 to 17.1 g of rifampicin. In the remaining 8 patients however, rifampicin was ineffective and had to be replaced by chloramphenicol.

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The incidence and significance of villous change was studied microscopically both in a retrospective review of 108 human colonic adenomatous polyps and a prospective study of 67 human colonic polypoid lesions. Retrospective review revealed villous change in 6% of solitary lesions, 15% of polyps with coexisting adenocarcinoma, 33% of those with coesisting villous adenoma, and 64% of polyps with carcinomatous transformation. Incidence of focal villous change was higher in the prospective study of the 67 colonic polypoid lesions. This feature was found in 35% of solitary adenomatous polyps and appeared to be directly related to polyp size, reaching 75% in lesions larger than 1 Cm in diameter. Estimation of villous pattern by dissecting microscope was accurate in 96% of cases studied. Although morphologically the adematous polyp with focal villous change appears to represent an intermediate form between the pure adenomatous polyp and villous adenoma, evidence for obligatory transformation and increased malignancy potential of this form is inconclusive. If biopsy reveals a villous area derived from an adenomatous polyp with focal villous change, the danger probably exists of overestimating the significance of the villous feature with resulting erroneous diagnosis and incorrect therapy. Histologic study and gross appearance of lesions must be correlated to make proper diagnosis.

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- D:Livbil (2076)
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- D:Gen:Parasit (2250)(2263)

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2024 CORRELATIONS BETWEEN CHRONIC AND MALIGNANT DISEASES OF THE PANCREAS. *(Ger.)* Grozinger, K. H. (Surg. Clin., U. Heidelberg, Germany), F. Dallengach and H. Heisler. *Langenbeck Arch Chir* 326(1):47-61, 1969.

2025 MEASUREMENT OF DUODENAL TRYPTIC ACTIVITY AND ^{75}Se-SELENOMETHIONINE PANCREATIC SCANNING COMPARED AS TESTS OF PANCREATIC FUNCTION. *(E.)* McCarthy, D. M. (Roy. Free Hosp., London, England) and P. Brown. *Gut* 10(11):913-920, 1969.

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026 FORMATION AND DESTRUCTION OF PLASMA KININS DURING EXPERIMENTAL HEMORRHAGIC PANCREATITIS IN DOGS. *(E.)* Ofstad, E. (Rikshospitalet, Oslo, Norway). *Scand J Clin Lab Invest* 24(supp 107):169-171, 1969.

The activities of kininogenase and kininase and the levels of kinins and kininogen in the plasma, urine and exudate of the right pancreatic lobe of dogs with acute hemorrhagic pancreatitis (produced by injection of taurocholate and trypsin into the main pancreatic duct) were investigated using bioassay techniques. Kininogenase activity was found in the exudate samples, as was very high kinase activity and the activities of both enzymes was strongest in the exudate samples collected early in the course of acute hemorrhagic pancreatitis. Free kinins were found in some exudate samples and the highest concentration corresponded to 30 ng of bradykinin eq/ml. The exudate did not contain any kininogen. The only kininogenase activity found in the plasma was that of glandular origin and it was detected in plasma fractions collected early during acute hemorrhagic pancreatitis. Plasma fractions collected before onset of pancreatitis or during sham operations contained no kinin-forming activity. After onset of acute hemorrhagic pancreatitis, increased kinase activity and some free kinin (30 mg bradykinin eq/ml) was found in the plasma. Kininogenase activity of the urine collected during the pancreatitis was high as compared to normal urine. Two kinin-forming enzyme activities (with molecular weight of 42,000 and 36,000) were detected by gel filtration on a column.

2027 INVESTIGATION ON THE BEHAVIOR OF HUMAN SERUM α-GLUCOSIDASE IN ACUTE PANCREATITIS. *(Ger.)* Adlung, J. (Med. Acad., Lubeck, Germany). *Z Gastroent* 7(5):402-406, 1969.

The activity of α-glucosidase was examined in the serum of 13 patients with increased α-amylase and lipase (nine of these patients suffered from acute pancreatitis). A group of 80 blood donors served for control purposes. Serum α-glucosidase activity (measured as maltase) was increased in all cases of acute pancreatitis with highest enzyme activities occurring in the most severe forms of the disease. The correlation between increased serum α-amylase activity and acute pancreatic disease was less reliable as judged by a patient with acute hemorrhagic necrosis of the pancreas whose α-glucosidase levels progressively increased but whose α-amylase levels returned to normal prior to death. Serum transaminases were only slightly increased in 3 of 9 patients with acute pancreatitis, thus ruling out a hepatic origin of increased serum α-glucosidase in acute pancreatitis. There was no increase in α-glucosidase in two patients with chronic pancreatitis and one patient with carcinoma of the bile duct. Separation of α-glucosidase from serum α-amylase was possible by chromatography on DEAE cellulose and thus confirmed the existence of two different carbohydrate-splitting enzymes in human serum.

2028 SURGICAL TREATMENT OF CHRONIC PANCREATITIS. *(E.)* Wolfe, W. G. (Duke U. Med. Ctr., Durham, North Carolina), D. Gamburg and W. W. Shingleton. *Amer Surg* 36(1):9-13, 1970.

2029 PANCREATIC ABSCESS SECONDARY TO ACUTE PANCREATITIS. *(E.)* Bransford, R. M. (Texarkana, Texas) and J. F. Bryant. *J Tennessee Med Ass* 62(12):1132-1133, 1969.

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2031 THE OCCURRENCE OF CARCINOMA OF THE PANCREAS IN CHRONIC PANCREATITIS. *(E.)* Robinson, A. (Kaiser Found. Hosp., Los Angeles, California), J. Scott and D. D. Rosenfeld. *Radiology* 94(2):289-290, 1970.

2032 A NEW OBSERVATION ON HUMAN INTRADUCTAL PANCREATIC PRESSURE. *(E.)* White, T. T. (Sch. Med., U. Washington, Seattle) and J. Bourde. *Surg Gynec Obstet* 130(2):275-278, 1970.

2033 SOLUBILIZATION AND PARTIAL FRACTIONATION OF THE SULPHUR-CONTAINING NUCLEAR PROTEINS OF HEPATOMA 223 ASCITES CELLS. *(E.)* Gronow, M. (Dept. Biochem, U. Oxford, England). *Europ J Cancer* 5(5):497-508, 1969.

The synthesis and metabolism of non-histone proteins of the cancer cell nucleus and the characteristics of the thiol contents of the nuclei were investigated in nuclei isolated from ascites hepatoma 223 maintained in ascitic form by weekly serial transplant in the peritoneal cavity of male albino Wistar rats. Nuclei, free from cytoplasmic contamination, were prepared by osmotic shock technique. Two extractions of nuclei with 8 M urea and 0.05 M sodium phosphate, at pH of 7.6, removed 89% of the total nuclear thiol material and 70% of protein and two further extracts with 0.25 M HCl removed another 6% of thiol material and 23% of protein. No DNA was solubalized by these procedures and RNA was separated by fractionation of urea-soluble material on G-100 Sephadex, DEAE and CM-celluloses. Fractionation of an acidic, glycine-rich fraction on G-200 Sephadix using gel electrophoresis and isoelectric focussing, was unsuccessful. Separation of some of the thiol components of urea-insoluble 0.25 M HCl-soluble histones was achieved on microgranular CM-cellulose.

2034 LIVER SCANNING IN PATIENTS WITH SUSPECTED OR PROVEN CANCER. *(E.)* Lin, S. R. (Jefferson Med. Coll. Hosp., Philadelphia, Pa.), C. M. Mansfield, S. Kramer and M. E. Southward. *Amer J Roentgen* 108(1):98-101, 1970.

Liver scans were performed on 1,151 patients (of whom 1,013 had proven malignant disease in sites other than the liver) to determine what proportion of these patients had a scan that was considered to represent metastatic disease in the liver. All scans were performed with a 3 or a 5 inch crystal Picker scanner and scanning was begun within 10 min after injection of 100 to 150 uc of I^{131}-labeled rose bengal. Thirty-nine percent of the patients with proven cancer, and 33% of those with suspected cancer had a scan indicative of metastatic disease. There was a 33% incidence of abnormal scans in the 138 cancer patients who had a scanning as a part of their routine work-up, which was near that of the total group. The routine use of liver scanning is justified in investigation of cancer patients.

2035 ON THE CAUSE OF THE INCREASED ACTIVITY OF ALKALINE PHOSPHATASE AND GAMMA-GLUTAMYL TRANSPEPTIDASE IN SERUM OF PATIENTS WITH LIVER METASTASES. *(E.)* Aronsen, K. F. (Malmo Gen. Hosp., Sweden), I. Hagerstrand, J. G. Norden and B. Pihl. *Acta Chir Scand* 135(7):619-624, 1969.

Liver biopsies (containing normal tissue and malignant tumor tissue) from 25 patients with liver metastases were examined histochemically for alkaline phosphatase and gamma-glutamyl transpeptidase. Both enzymes were enhanced in the hepatic tissue from patients with malignant growth as compared with control needle liver biopsies. In the tissue with malignant growth, the alkaline phosphatase sinusoidal reaction was stronger than is normally seen and the usual gamma-glutamyl transpeptidase canalicular reaction could often be seen throughout the lobules (canalicular enhancement was more marked at the periphery of tumor growth in about half of the cases). In 8 cases the malignant cells contained gamma-glutamyl transpeptidase but not alkaline phosphatase. Dilated sinusoids at the periphery of tumor growth showed a strong reaction for alkaline phosphatase in 21 cases, suggesting that the increase may be connected with vascularization of the tumor (sometimes the canalicular reaction was enhanced in the vicinity of the malignant tissue). Cholestasis of the hepatic tissue was only observed in 7 cases and does not appear to be the only explanation for the increased serum activity of the enzymes.

2036 HEPATOCANCEROGENESIS IN MICE WITH THE SIMULTANEOUS ADMINISTRATION OF DIETHYLNITROSAMINE AND THE VIRUS MOTOL. *(E.)* Kordac, V. (I. Int. Clin., Prague, Czechoslovakia), E. Schon and A. Braun. *Neoplasma* 16(5):485-490, 1969.

White mice were treated with the chemical cancerogen diethylnitrosamine (0.009 g/kg, p.o.) and the human hepatitis virus Motol (0.1 LD_{50}, i.p.), either alone or in combination. Death occurred in 24/106 mice within 14 days after infection with Motol virus and tissue sections from these mice were characterized by acute necrotizing hepatitis. In mice treated with diethylnitrosamine, either alone or simultaneously with Motol virus infection, body weight was reduced, liver weight was increased and there were marked changes in liver parenchyma characterized by macroscopic enlargement of the granular surface, and the appearance of numerous nodes (some hemorrhagic) on the liver surface. These changes were most marked in mice who received diethylnitrosamine and Motol virus simultaneously. Histological examination of the liver of mice treated with diethylnitrosamine, either alone or simultaneously with Motol virus infection, showed proliferation of bile ducts (often cystically enlarged and containing mucus), the appearance of granular tissue, degeneration (hyaline changes, pyknoses, trabecular necrosis) of the liver parenchyma, cirrhotic changes, and the occurrence of hepatomas.

2037 CONGENITAL NONOBSTRUCTIVE NONHEMOLYTIC JAUNDICE. *(E.)* Yaffe, S. J. (Buffalo, N. Y.), R. Gorodischer, G. Levy and J. Krassner. *New Eng J Med* 282(7):375-377, 1970.

An infant with congenital nonobstructive nonhemolytic jaundice (which was unresponsive to phenobarbital) who had serum bilirubin levels as high as 35.4 mg/100 ml and had received several exchange transfusions, was treated successfully with phototherapy. At 19 weeks of age the infant was exposed to six 30-watt daylight bulbs, and within 3 days a marked fall in serum bilirubin to 19.6 mg/100 ml occurred, followed by a further fall to 9.0 mg/100 ml in the subsequent 3 days. The light was then changed to eight 40-watt blue light bulbs for 12 hr/day and serum ilirubin was maintained between 6.3 and 8.3 mg/100 l for 60 days. Discontinuation of phototherapy for 4 hr caused serum bilirubin to rise from 7.9 to 1.7 mg/100 ml, and reinstitution of light treatment aused the level to fall to 7.6 mg/100 ml within 67 r. The child did not conjugate salicylamide norally as the glucuronide, but N-acetyl-p-aminophenol as glucuronidated normally. Normal levels of biliubin glucuronyl transferase activity were present. ikethamide therapy was initiated and serum bilirubin evels remained between 6.3 and 8.3 mg/100 ml. At 8 weeks of age developmental and neurological exminations were normal.

2038 EFFECTIVE PHOTOTHERAPY IN CONGENITAL NON-OBSTRUCTIVE NONHEMOLYTIC JAUNDICE. *(E.)* Karon, M. (Child. Hosp. Los Angeles, Calif.), D. Imach and A. Schwartz. *New Eng J Med* 282(7):377-380, 1970.

An infant with congenital nonobstructive nonhemolytic jaundice (total serum bilirubin level of 34 mg and an indirect fraction of 33 mg/100 ml) and a lefective ability to conjugate p.o. sodium salicylate was treated by phototherapy with daylight fluorescent bulbs (eleven 20 watt bulbs) and a 4 day course of phenobarbital. Phototherapy was discontinued at the age of 16 days at which time the serum bilirubin level reached a plateau of 8-10 mg/100 ml, then increased to 15 mg/100 ml at 26, decreased to 4 mg/100 ml at 34 (during continous phototherapy), and increased again at a rate of 1 mg/100 ml/day (after phototherapy had been discontinued). Following phototherapy (four 40 watt bulbs) for 12 to 14 hr/day, serum bilirubin levels remained between 7 and 8.5 mg/100 ml until the age of 3-1/2 months, after which serum bilirubin levels increased to 10-11 mg/100 ml at 5 months of age. Neurological and developmental examinations were normal at 5 months of age, and the increase in serum bilirubin levels at this time was probably due to pigment production from increased red cell mass.

2039 FIRST EXPERIENCE WITH A COMPUTER PROGRAM FOR THE DIFFERENTIAL DIAGNOSIS OF LIVER DISEASE. *(Ger.)* Gangl, A. (2nd U. Med. Clin. Vienna, Austria), G. Grabner and P. Bauer. *Wiener Z Inn Med* 50(12):553-586, 1969.

Theoretical basis and practical application of a computer program for differential diagnosis of liver diseases are described. The program avoids all graduated probabilities but includes all diseases possible in the presence of a certain symptom constellation (instead of offering one single probable diagnosis). All theoretically possible diagnoses are presented together with a list of suggested methods of detection. The program also provides for the corresponding reasons whenever the computer produces or excludes a diagnosis. The system includes multiple checks for completeness and accuracy designed to indicate non-specified symptoms, to test prerequisites and to detect contradictions in the input system. At various steps during the course of the program, the physician may choose different cardinal symptoms to explore a pathologic picture along various directions and guide differential diagnosis in agreement with his experience without risking to overlook infrequent possibilities.

2040 METABOLIC BALANCES OF SULFUR IN PATIENTS WITH HEPATOLENTICULAR DEGENERATION AND EFFECT OF THE USE OF D-PENICILLAMINE. *(E.)* Canelas, H. M. (U. San Paulo Med. Sch., Brazil), F. B. DeJorge and W. A. Tognola. *Arq Neuropsiquiat* 27(4):266-270, 1969.

2041 HEPATIC RUPTURE AND HEMORRHAGE FROM METASTATIC CARCINOMA OF LIVER. *(E.)* Caneghem, A. V. (New York Polyclin. Hosp., N. Y.) and A. M. Gelb. *N Y J Med* 70(2):303-305, 1969.

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- P:Morph (1581)(1595)
- P:Secr:Panc (1692)
- P:Secr:Hepatobil (1703)(1728)(1759)(1763)
- Diagproc (1801)(1803)(1805)(1811)(1816)(1821) (1822)(1824)
- D:Livbil:C.Hep (2125)
- D:Livbil:Gallb (2173)
- D:Gen (2188)
- D:Gen:Parasit (2265)

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The problem of potential hepatic involvement in chronic polyarthritis was studied in liver biopsy material from 122 patients with activity stages II to IV of chronic rheumatoid polyarthritis. Light microscopy demonstrated normal hepatic histology in 24 patients and minor nonspecific alterations in the remaining cases. Only 3 of 122 patients showed changes consistent with "reactive hepatitis" characterized by periportal infiltration of lymphocytes and histiocytes as well as reactions in the Kupffer cells. These changes are probably related to chronic rheumatoid arthritis and their low incidence in the present patient series is in good agreement with the findings of most other authors and does not confirm the concept of "rheumatoid hepatitis".

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The most frequent form among 21 cases of hepatitis in infants was cholestatic hepatitis (16). Two cases were diagnosed as hepatitis on the basis of cholangitis and three infants suffered from the adult form of hepatitis (two of these died subsequently from generalized cytomegalic disease). Typical giant liver cells were found in only 8 instances; in three infants, a transition from cholestatic hepatitis without giant cells to giant cell hepatitis did not occur until the fourth month of life. Etiologically defined, particular types in this series included 2 cases of toxoplasmosis hepatitis and 1 case each of rubella hepatitis and tuberculous hepatitis following BCG vaccination. As a rule, the clinical course was favorable with only two deaths resulting from liver damage.

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2093 SPECIFIC GRAVITY OF LIVER CELLS DURING HEPATOCARCINOGENESIS BY N-NITROSODIETHYLAMINE IN RATS. *(E.)* Imaizumi, T. (Cancer Inst., Tokyo, Japan) and S. Takayama. *GANN* 60(5):499-502, 1969.

2094 LUPOID HEPATITIS. *(Dut.)* Speissens, H. (no affil). *T Geneesk* 25(24):1267-1268, 1969.

2095 TRAUMATIC RUPTURE OF THE LIVER: CLINICAL AND THERAPEUTIC CONSIDERATIONS. *(It.)* Biliotti, G. (Hosp. Central, Rome, Italy), M. Marzi, G. Misiti and B. Sbuelz. *Chir Gastroent* 2(supp 1):49-69, 1968.

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A DIAGNOSTIC PROBLEM. *(E.)* Parrish, R. A.,
(Eugene Talmadge Mem. Hosp., Augusta, Ga.) and
Still. *Med Times* 98(2):157-160, 1970.

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chard and J. L. Lortat-Jacob. *Vie Med*
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Juan, F. (State Serv. Hosp., Rio de
neiro, Brazil), F. Duarte, M. Treiger, N. M.
galhaes and H. J. Castro. *Hospital (Rio)*
(2):427-445, 1969.

03 SERUM HYALURONIDASE ACTIVITY IN CHRONIC
LIVER DAMAGE. *(E.)* Nakamura, N. (Osaka
Med. Sch., Japan), N. Iwabori and T. Koizumi.
in Chim Acta 27(1):47-52, 1970.

P:Morph (1714)(1715)
D:Pancreas (2021)
D:Livbil (2041)(2042)(2049)
D:Livbil:Cirrh (2138)
D:Livbil:Gallb (2167)

2104 POSTTRANSFUSION HEPATITIS AFTER OPEN-HEART OPERATIONS: INCIDENCE AFTER THE ADMINISTRATION OF BLOOD FROM COMMERCIAL AND VOLUNTEER DONOR POPULATIONS. *(E.)* Schmidt, P. J. (Natl. Inst. Hlth., Bethesda, Md.), J. H. Walsh, R. H. Purcell, A. G. Morrow and R. M. Chanock. *JAMA* 211(2):261-265, 1970.

Incidence of icteric and anicteric hepatitis was determined in 110 patients undergoing open-heart operations in which cardiopulmonary bypass was used. One group (82 patients) received commercially obtained blood and a second group (28 patients) received blood from local volunteer donors. Serial determinations of serum transaminase levels and blood chemistry determinations were obtained for 6 months postoperatively. Forty-two (51%) of the patients receiving the commercial blood developed hepatitis, and of these 13 (31%) became icteric. Hepatitis did not occur in patients receiving blood from volunteer donors. The hepatitis carrier rate for commercial blood donors was 6.3% and was only 0.6% for volunteer donors. One patient died from hepatitis during the study period. The chance of hepatitis developing appears to be higher (P 0.05) among patients obtaining blood from commercial sources than from local volunteer sources.

2105 FATAL HEPATITIS IN SAUDI ARABIAN WOMEN. *(E.)* Gelpi, A. P. (Stanford U. Sch. Med., Palo Alto, California). *Amer J Gastroent* 53(1): 41-61, 1970.

A 10-yr retrospective study of viral hepatitis mortality was carried out on a group of Saudi Arabian patients admitted to medical facilities of the Arabian American Oil Company. Tabulation of hospital discharge diagnoses during the period 1953 through 1962 discloses a significant mortality for both sexes, but death rate was 7 times higher in females than in males. Pregnant females showed a mortality rate of 46.3% and within this group there was a concomitant high fetal mortality. Factors which appeared to be consistently associated with high maternal mortality included: hepatitis contracted in late pregnancy, abortion or delivery of a stillborn, hyperpyrexia, presence of coma on admission, ascites and/or edema, a hemorrhagic diathesis, and a prolonged one-stage prothrombin time. Survivors and patients with fatal outcome showed no differences in nutritional status. Excess mortality among females indicates a true sex difference in response to the disease with pregnant women unusually susceptible to a fatal outcome. Intensive early treatment with adrenal corticosteroids and one-stage prothrombin determinations for monitoring hepatic function are currently being used. Semitic populations seemingly may be at considerable risk from fatality during pregnancy when comparing natural history of viral hepatitis in Saudi Arabians with other Middle East and North African countries. Ethnic variations in response to disease, geographical differences in virulence, and nutritional deficiencies among women in semitic populations remain speculative.

2106 LYMPHOBLASTOID CELL CULTURE FROM PATIENTS WITH INFECTIOUS HEPATITIS. *(E.)* Stevens, D. P. (Natl. Inst. Hlth., Bethesda, Md.), L. F. Barker, R. Fike, H. E. Hopps and H. M. Meyer, Jr. *Proc Soc Exp Biol Med* 132(3):1042-1046, 1969.

Specimens of blood for leukocute culture were obtained from 16 controls and 35 servicemen (18 to 36 yr old) with infectious hepatitis during an epidemic of the disease. Continuous suspension cell lines were established from 21 of the patients (60%) and 3 of the controls (19%) and the proliferation tendency did not correlate with the severity of the disease. Cultures generally became established earlier from the patients with infectious hepatitis than from the controls and the mean time at which continuous growth began was 40 days for cultures from infectious hepatitis patients and 60 days for those from the controls. The cultures were negative for bacteria, fungi and mycoplasma. Generally, the cells grew in suspension in clumps, the viable count doubled every 24 to 48 hr under optimal conditions, and most of the cells were lymphoblasts (the remainder were atypical and mature lymphocytes).

2107 HEPATITIS IN NEPHROPATHIC SUBJECTS UNDERGOING PERIOD HEMODIALYSIS. *(Ital.)* Pasqualicchio, A. (Major Hosp. Verona, Italy), G. Gianfranceschi, L. Bonazzi and F. Verita. *Fracastoro* 62(3):263-266, 1969.

SGOT and SGPT were determined systematically in 41 patients undergoing periodic hemodialysis for chronic renal disease. Over a period of 6 months each of these patients was subjected to an average of 34 dialyses and 12 blood transfusions. Hepatitis (as judged by a significant and prolonged increase in serum transaminases) was diagnosed in 13 of these patients (31.7%); in 11 instances the disease took an anicteric course but in one patient it was associated with fatal acute yellow atrophy. Subdivision of the patients into group I with less than 15 blood transfusions and group II with more than 15 transfusions revealed that the incidence of hepatitis was 28% in the first and 68% in the second group (indicating a relationship to the number of transfusions rather than hemodialysis). No case of hepatitis occurred during the observation period among medical and nursing personnel.

2108 EPIDEMICS OF INFECTIOUS HEPATITIS: THEIR RELATIONSHIP TO THE INCIDENCE OF DOWN'S SYNDROME IN MEMPHIS. *(E.)* Kashgarian, M. (U. Tennessee Coll. Med., Memphis), R. C. Rendtorff and E. W. Fowinkle. *J Tennessee Med Ass* 63(1): 29-33, 1970.

The relationship between the incidence of infectious hepatitis (excluding serum hepatitis) and the incidence of Down's syndrome was studied in Memphis-Shelby County, Tennessee from 1955 to 1966. There were 1,479 cases of reported hepatitis and 192 cases of Down's syndrome during this 12 yr period. Both diseases occurred with distinct epidemic peaks and troughs, hepatitis being epidemic during 1961-1962 nd an aggregation of Down's syndrome occurring in 961 and again in 1963. The incidence patterns of he two diseases were not correlated. The hypothe- is that subclinical hepatitis may act upon the ovum efore or after fertilization to cause Down's syn- lrome cannot be rejected, however, since tendencies n aggregations of cases between the two diseases do ppear to exist.

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2110 TREATMENT OF ACUTE VIRAL HEPATITIS. *(Fr.)* Hoenig, V. (Clin. Int. Med., Prague, Czechoslovakia). *Epatologica* 15(1):9-16, 1969.

2111 RHEUMATOID FACTOR AND REACTIVE HEPATITIS. *(Sp.)* Polit, M. O. (Clin. Soc. Security, Quito, Ecuador). *Rev Ecuat Med Cienc Biol* 7(2):86-92, 1969.

2112 ACUTE KIDNEY FAILURE IN CASES OF VIRAL HEPATITIS. CONTRIBUTION TO THE HEPATORENAL SYNDROME. *(Ger.)* Reinschke, P. (no affil) and I. Krumhaar. *Deutsch Gesundh* 24(47):2219-2222, 1969.

2113 TYPHOID HEPATITIS. *(Heb.)* Assif, E. (no affil), Z. Spirer and N. Bogair. *Harefuah* 77(10):466-467, 1969.

2114 ANTIGENS AND ANTIBODIES IN VIRAL HEPATITIS: AUSTRALIA ANTIGEN. *(Fr.)* Soulier, J. P. (Natl. Blood Transfusion Ctr., Paris, France). *Rev Franc Transfus* 12(3):303-317, 1969.

2115 VIRAL HEPATITIS: CLINICAL PICTURE AND LABORATORY FINDINGS ON 404 OBSERVATIONS. *(It.)* De Luca, F. (2nd Med. Clin., U. Rome, Italy), R. M. Piancone, M. De Felice, L. Cramarossa, M. Andreoli and M. Negri. *Policlinico* 76(46):1477-1490, 1969.

2116 HEPATITIS VIRUS AND RENAL DIALYSIS. *(E.)* anon. *Lancet 2* (7628):989-990, 1969.

2117 MANAGEMENT OF HEPATIC COMA COMPLICATING VIRAL HEPATITIS. *(E.)* Pirola, R. C. (Dept. Med., U. New South Wales, Australia), J. M. Ham and R. G. Elmslie. *Gut* 10(11):898-903, 1969.

2118 KININASE ACTIVITY OF PLASMA FROM PATIENTS WITH ARTERIOSCLEROSIS, DIABETES AND HEPATITIS. *(E.)* Dedichen, J. (Rikshospitalet, Oslo, Norway) and J. Vystyd. *Scand J Clin Lab Invest* 24(supp 107):125-127, 1969.

2119 PROPHYLAXIS AGAINST INFECTIOUS HEPATITIS. *(E.)* anon. *Brit Med J* 4(5683):576, 1969.

2120 HEMOLYSIS IN HEPATITIS AND JAUNDICE. *(E.)* anon. *Brit Med J* 4(5684):637-638, 1969.

2121 VIRAL HEPATITIS. *(Fr.)* Desche-Labarthe, S. (Cochin Hosp., Paris, France). *Rev Med* 10(28):1821-1826, 1969.

2122 LAPAROTOMY IN VIRAL HEPATITIS. *(It.)* Feo, F. (no affil). *Minerva Med* 60(88):4395, 1969.

2123 LOCATION OF BILE PIGMENTS IN THE LIVER AND ITS SIGNIFICANCE IN THE COURSE OF VIRAL HEPATITIS: STUDY IN THE ELECTRON MICROSCOPE. *(E.)* Pavel, I. (Cantacuzino Hosp., Ctr. Electron Microscopy Cantacuzino Inst., Bucharest, Rumania), H. Bonaparte and A. Petrovici. *Rev Roumaine Med Intern* 5(6):315-321, 1969.

- D:Livbil (2052)
- D:Livbil:Cirrh (2133)(2138)(2152)
- D:Livbil:Gallb (2167)

2124 IMMUNOSUPPRESSANT TREATMENT OF CHRONIC AGGRESSIVE HEPATITIS. *(Ger.)* Gros, H. (State Med. Clin., Saarbrucken Hosp., Germany) and K. Zwirner. *Munchen Med Wshr* 111(48):2481-2485, 1969.

The results of prolonged azathioprine treatment for chronic aggressive hepatitis were examined in 42 patients. Initial daily doses of 200 mg of the drug were continued until definite improvement (as judged by normalization of the serum transaminases) was obtained. Treatment with maintenance doses of 100-150 mg was then given for average periods of 18 months except for instances of leukopenia or thrombocytopenia in which reductions to 50 mg/day were necessary. Abrupt withdrawal of the drug or premature dose reductions were associated with exacerbation of the disease. Clinical improvement occurred in 74% of the cases but a persistent normalization of the transaminases was demonstrable in only 29% of the patients. Histologically, regression of inflammatory activity occurred in 55% of the cases, proliferation in 42%, and no change in 58%. In some cases, inflammatory activity decreased during azathioprine treatment but connective tissue proliferation continued independently resulting in hepatic cirrhosis. Small doses of glucocorticoids for inhibition of proliferation are recommended during immunosuppressant treatment of chronic aggressive hepatitis.

2125 HETERO-ANTIBODY AGAINST BILE CANALICULI IN PATIENTS WITH CHRONIC, CLINICALLY ACTIVE HEPATITIS. *(E.)* Diederichsen, H. (Town Country Hosp., Odense, Denmark). *Acta Med Scand* 186(4):299-302, 1969.

An organ-specific, heterologous antibody to the bile canaliculi of bovine liver was demonstrated in the serum from 5 patients with chronic clinically-active hepatitis, 1/10 patients with systemic lupus erythematosus, and 1/31 patients with positive antinuclear factor without systemic lupus erythematosus but not in the serum from 5 patients with acute hepatitis, 11 with cholecystitis and 35 normal donors. The bile canaliculi antibody could not be demonstrated in normal human liver tissue or in liver tissue from 2 patients with chronic, clinically-active hepatitis, and was always found concurrently with antinuclear factor against normal human liver tissue. The bile canaliculi antibody was found together with smooth muscle antibody and glomerulus antibody in 5 patients with chronic clinically-active hepatitis.

2126 A CONTROLLED TRIAL OF A PROTEIN-FREE LIVER EXTRACT IN THE TREATMENT OF CHRONIC LIVER DISEASE. *(E.)* Toghill, P. J. (King's Coll. Hosp., London, England), R. P. Knill-Jones and R. Williams. *Gut* 10(11):882-885, 1969.

2127 PROGNOSIS OF CHRONIC PERSISTENT HEPATITIS. *(E.)* Becker, M. D. (Roy. Free Hosp., London, England), A. Baptista, P. J. Scheuer and S. Sherlock. *Lancet 1* (7637):53-56, 1970.

2128 THE PATHOGENESIS OF CHRONIC HEPATITIS. *(Ger.)* Rossler, R. (U. Med. Clin., Marburg/Lahn, Germany) and K. Havemann. *Deutsch Med Wschr* 95(1):34-39, 1970.

- D:Gen (2242)

129 PLASMA PHOSPHOLIPIDS IN CIRRHOSIS OF LIVER AND FATTY LIVER. *(E.)* Kunz, F. (Dept. nt. Med., U. Innsbruck, Austria) and D. Kosin. *lin Chim Acta* 27(1):185-196, 1970.

lasma phospholipid levels were determined in normal ubjects, cirrhotic patients and patients with fatty iver by one-dimensional thin-layer chromatography. n patients with progressive liver damage, lysolecthin and lysocephalin levels were decreased and the owest lysolecithin, lysocephalin and total phosphoipid levels occurred in cirrhotic patients with a oor prognosis. In all patients with liver damage ecithin levels were increased and sphingomyelin evels were decreased from control values. Phosphatdylserine and phosphatidylinositol levels were inreased above normal in all cirrhotic patients (exept the nonicteric group) and phosphatidylethanolmine levels were significantly increased above noral in patients with compensated cirrhosis and faty liver. There was a positive correlation between hosphatidylethanolamine and SGOT levels and also etween phosphatidylinositol and alkaline phosphaase levels in patients with compensated cirrhosis. [t appears that phospholipids are important factors in the pathogenesis of fatty liver and cirrhosis and that plasma phospholipids reflect the changes of liver phospholipids in both disease states.

2130 EXCESSIVE OUTPUT OF BILE IN CHRONIC HEPATIC DISEASE. *(E.)* Lenthall, J. (U. Southern California Med. Ctr., Los Angeles), T. B. Reynolds and A. J. Donovan. *Surg Gynec Obstet* 130(2):243-253, 1970.

Excessive output of bile was evaluated in 7 patients with severe hepatic disease; 5 had Laennec's cirrhosis, 1 had biliary cirrhosis, and 1 had protracted extrahepatic biliary obstruction. Bile excretion greater than 2000 ml in 24 hrs is considered excessive. Patients' bile volume ranged from 2300 ml to 8400 ml, the sodium concentration of the bile ranged from 116 to 189 millequivalents per liter, the potassium concentration ranged from 3.4 to 5.1 milliequivalents per liter, total bilirubin excretion for 24 hrs was 80,132,217, and 230 mg in 4 patients. The excessive volume of bile may seemingly represent a means for the drainage of the expanded interstitial fluid compartment of the liver resulting from hepatic venous obstruction.

2131 SERUM IRON LEVELS IN JAUNDICE IN INFANCY AND CHILDHOOD. *(E.)* Husain, S. (M. G. M. Med. Coll., Indore, India) and J. N. Pohowalla. *J Indian Med Ass* 53(5):237-240, 1969.

Serum iron and bilirubin levels were studied in 50 pediatric patients with icterus and in 15 normal children. Serum iron levels were high normal in infantile cirrhosis (88-221 µg %) and icterus neonatorum (101-309 µg %) and significantly increased in infective hepatitis (66-553 µg %) and hemolytic anemia (110-309 µg %) as compared to normal controls (71-209 µg %). Serum bilirubin showed parallel changes in each condition (infantile cirrhosis: 2.5 - 12.2 mg %; icterus neonatorum: 2.0 - 12.2 mg %; infective hepatitis: 3.3 - 8.0 mg %; hemolytic anemia: 1.7 - 6.8 mg %; control: 0.76 - 2.0 mg %). While cirrhosis and acute hepatitis associated with jaundice may present a diagnostic problem in the absence of liver biopsy, near normal values of serum iron may indicate a cirrhotic rather than an inflammatory origin of the liver disease. In acute hepatitis, it appears that extensive hepatocellular damage is responsible for the marked rise in serum iron. The high values of serum iron in icterus neonatorum are attributed to rapid breakdown of erythrocytes, functional immaturity of liver and some element of regurgitation. Since serum iron values in hemolytic anemia depend upon several factors, several estimations of serum iron would appear to be a better guide than a single estimation carried out at the onset of illness.

2132 NEW SELECTIVE DECOMPRESSION OF ESOPHAGEAL VARICES BY A LEFT GASTRIC VENOUS-CAVAL SHUNT. *(E.)* Inokuchi, K. (Kyoshu U. Sch. Med., Fukoka, Japan), M. Kobayashi, A. Kusaba, Y. Ogawa, M. Saku and T. Shiizaki. *Arch Surg* 100(2):157-162, 1970.

A new surgical technique for severe types of cirrhosis in which selective shunting was accomplished through the left gastric vein and vena cava was performed on 25 patients with portal hypertension (21 with cirrhosis of the liver). Only 2 operative deaths and 1 late death occurred in spite of the shunting rate of 40% or more. Mean portal pressure decreased insignificantly from 363 to 335 mm of water postoperatively, while that of the left gastric vein decreased from 316 to 211 mm of water. Esophageal varices, which were present in all the patients, disappeared in 13 patients and were markedly decreased in 9 patients postoperatively. All 22 patients had no recurrence of esophageal bleeding during a 2-yr follow-up period. The postoperative blood level of ammonia was low compared with that in patients with splenorenal shunts.

2133 HEPATITIS-ASSOCIATED ANTIGEN IN CHRONIC LIVER DISEASE. *(E.)* Reinicke, V. (Bispebjerg Hosp., Copenhagen, Denmark) and E. Nordenfelt. *Lancet* 1(7638):141-142, 1970.

The presence or absence of hepatitis-associated antigen (Au/SH) was studied in 58 patients with chronic liver disease (confirmed by liver biopsy) by a double-diffusion micro-ouchterlony technique. Au/SH antigen was often demonstrable with sera from patients with acute viral hepatitis, but negative results were obtained with sera from 17 patients with chronic hepatitis, 14 with cryptogenic cirrhosis, 3 with cryptogenic steatosis, 22 with alcoholic liver disease, and 2 with biliary cirrhosis. These findings are not in agreement with those of some other investigators who report a high percentage of sera positive for Au/SH antigen in chronic liver disease.

2134 THE METABOLISM OF AMMONIA IN LIVER DISEASE: A COMPARISON OF URINARY DATA FOLLOWING ORAL AND INTRAVENOUS LOADING OF [$^{-15}$N] AMMONIUM LACTATE. *(E.)* Gay, W. M. B. (Queen Elizabeth Hosp., Birmingham, England), C. W. Crane and W. D. Stone. *Clin Sci* 37(3):815-823, 1969.

Ammonia metabolism was investigated in three normal subjects and in three patients with cirrhosis and portacaval anastomoses using oral and intravenous administration of [$^{-15}$N] ammonium lactate and urinalysis. Following intravenous administration to the normal subjects, the pattern of urea and ammonia excretion was similar to that shown by the patients following either oral or intravenous administration. The results are considered to support the hypothesis that portal-systemic shunting is the major cause of the abnormalities of ammonia metabolism previously demonstrated in patients with liver disease.

2135 THE EFFECT OF CIRRHOSIS OF THE LIVER ON MICROSOMAL DETOXICATIONS AND CYTOCHROME P-450. *(E.)* Marshall, W. J. (U. Coll. Hosp. Med. Sch., London, England) and A. E. M. McLean. *Brit J Exp Path* 50(6):578-583, 1969.

2136 PERFUSIONS, ACID-BASE EQUILIBRIUM AND CIRRHOSIS. *(Fr.)* Beraud, C. (St. Andre Hosp., Bordeaux, France), M. Bernard and J. Dangoumau. *Therapie* 24(5):891-897, 1969.

2137 PORTAL HYPERTENSION SECONDARY TO LAENNEC'S CIRRHOSIS AND PORTAL VEIN THROMBOSIS: REPORT OF A CASE. *(E.)* Stoney, R. J. (U. California Sch. Med., San Francisco) and L. H. Cohn. *Ann Surg* 171(1):158-159, 1970.

2138 SERUM CHOLINE ESTERASE AND HEPATIC DISORDERS. *(E.)* Singh, D. (M. G. M. Med. Coll., Indore, India), S. B. Bapna and J. D. Khandekar). *J Ass Physicians India* 17(9):511-516, 1969.

2139 CLINICAL EXPERIMENTATION ON A NEW CHOLERETIC HEPATOPROTECTOR IN THE TREATMENT OF ALCOHOLIC CIRRHOSIS. *(Fr.)* Rodat, D. (Hosp. St. Jacques, Nantes, France). *Ouest Med* 22(21):1478-1482, 1969.

2140 LIVER CIRRHOSIS: MODERN CONCEPTS. *(E.)* Scheuer, P. J. (Roy. Free Hosp., London, England). *Arq Gastroent* 6(4):205-208, 1969.

2141 THE REDOX STATE OF THE MITOCHONDRIAL NAD SYSTEM IN CIRRHOSIS OF THE LIVER AND IN CHRONIC QUANTITATIVE UNDERNUTRITION IN THE RAT. *(E.)* Henley, K. S. (U. Michigan Med. Sch., Ann Arbor) and E. G. Laughrey. *Biochim Biophys Acta* 201(1):9-12, 1970.

2142 HYPERSPLENOMEGALIC CIRRHOSIS OF THE LIVER WITH DIFFUSE HEMORRHAGES: DISCUSSION OF THE ROLE OF HYPERSPLENISM. *(Fr.)* Lorriaux, A. (no affil), J. P. Mizon and F. Gentit. *Lille Med* 14(9):1046-1049, 1969.

2143 ORIGIN OF RED BLOOD CELLS IN THORACIC DUCT LYMPH IN HEPATIC CIRRHOSIS. *(E.)* Dumont, A. E. (New York U. Sch. Med., New York), C. L. Witte, M. H. Witte and W. R. Cole. *Ann Surg* 171(1):1-8, 1970.

2144 LATENT HEPATIC CIRRHOSIS: A STUDY OF 95 CASES. *(E.)* Ludwig, J. (Mayo Clin., Rochester, Minn.), C. O. Garrison and A. H. Baggenstoss. *Amer J Dig Dis* 15(1):7-14, 1970.

2145 RENAL VASODILATOR THERAPY IN THE HEPATORENAL SYNDROME. *(E.)* Cohn, J. N. (VA Hosp., Washington, D.C.), F. E. Tristani and I. M. Khatri. *Med Ann DC* 39(1):1-7, 1970.

2146 ROLE OF VARIOUS CAUSES OF ARTERIAL DESATURATION IN LIVER CIRRHOSIS. *(E.)* Chiesa, A. (Med. Clin., U. Torino, Italy), G. Ciappi, L. Balbi and L. Chiandussi. *Clin Sci* 37(3):803-814, 1969.

2147 THE ALTERATION OF THE REGULATION OF THE ACID-BASE ELECTROLYTE IN THE COURSE OF LIVER CIRRHOSIS. *(It.)* Campanini, H. (Major Hosp., Novara, Italy) and G. C. Allegra. *Arch Ital Mal Appar Dig* 35(6):572-578, 1969.

2148 ASPECTS AND PHYSIOPATHOLOGY OF THE 17-HYDROXY-CORTICOSTEROIDS METABOLISM IN PATIENTS WITH LIVER CIRRHOSIS. *(It.)* Villano, F. (U. Sassari, Italy). *Riforma Med* 83(46):1351-1353, 1969.

2149 SOME METABOLIC ASPECTS OF CIRRHOTIC PATIENTS KEPT ON HIGH SUGAR REGIMEN. *(It.)* Gastaldi, F. (Inst. Semiotic Med., U. Pavia, Italy), C. Rampulla, E. Molinari and A. E. Regazzini. *Epatologia* 14(6):557-567, 1968.

2150 FUNCTIONAL RENAL FAILURE IN CIRRHOSIS. *(E.)* Lieberman, F. L. (U. Southern Calif. Sch. Med., Los Angeles). *Gastroenterology* 58(1):108-110, 1970.

2151 ENDOCRINE ABNORMALITIES IN CHRONIC LIVER DISEASE. *(E.)* Harris, P. W. R. (Guy's Hosp., London, England). *Guy Hosp Rep* 118(3):387-393, 1969.

52 THE REGENERATION TENDENCY OF ALCOHOL-INDUCED LIVER DAMAGE DURING PERIODS OF AB-
NENCE. *(Ger.)* Irsigler, K. (1st U. Med. Clin.,
enna, Austria), E. Keibl, K. Krypsin-Exner and W.
dschuh. *Acta Hepatosplen* 16(6):356-371, 1969.

53 SIDE-TO-END PORTACAVAL SHUNT: A WAY OUT OF DIFFICULTY. *(E.)* Little, J. M. (Dept.
rg., U. Sydney, Australia). *Aust New Zeal J Surg*
(2):176-179, 1969.

54 DERMATOGLYPHICS IN INDIAN CHILDHOOD CIRRHOSIS. *(E.)* Chandra, R. K. (All-India
st. Med. Sci., New Delhi, India). *Hum Hered*
(5):540-545, 1969.

55 SYPHILIS AND HEPATIC CIRRHOSIS. *(E.)* anon. *Lancet 1* (7636):28-29, 1970.

156 EXPERIMENTAL HEPATIC ENCEPHALOPATHY IN THE RAT: CLINICAL AND ENCEPHALOGRAPHIC
TUDIES. *(Fr.)* Benhamou, J. P. (Hosp. Beaujon,
lichy, France), J. D. Degos, R. Cloche and H.
lsmuth. *Rev Franc Etud Clin Biol* 14(3):260-266,
969.

157 CIRRHOSIS OF THE LIVER. (A PATHOLOGICAL STUDY OF 83 POST-MORTEM CASES). *(E.)*
eddy, D. B. (Guntur Med. Coll., Andhra Pradesh,
outh India) and B. M. Saran. *Antiseptic*
6(9):655-664, 1969.

158 UMBILICAL VEIN CATHETERIZATION AND CIRRHOSIS. *(E.)* Rachlin, L. (VA Hosp.,
ivermore, Calif.), R. H. Hansen and J. J. Carolan.
urg Gynec Obstet 130(2):272-274, 1970.

2159 HYPERTROPHIC OSTEOARTHROPATHY: A REVIEW AND A CASE REPORT IN PORTAL CIRRHOSIS.
(E.) Vaidya, A. B. (G. S. Med. Coll., Bombay, In-
dia), R. C. Khokhani and M. J. Shah. *Indian Pract*
22(10):595-599, 1969.

2160 ESTROGEN METABOLISM IN CIRRHOSIS OF THE LIVER. *(E.)* Tripathy, A. M. (S. C. B.
Med. Coll., Cuttack, India) and S. M. Haque. *J
Indian Med Ass* 53(9):440-443, 1969.

2161 ELECTROCARDIOGRAMS IN HEPATIC CIRRHOSIS. *(It.)* Ballarino, M. (Inst. Clin. Med.
Gen., U. Milan, Italy) and R. Romola. *Fegato*
15(2):175-180, 1969.

- P:Secr (1665)
- P:Secr:Hepatobil (1706)(1721)
- Diagproc (1810)
- D:Livbil (2042)(2058)
- D:Livbil:C.Hep (2124)(2126)
- D:Livbil:Gallb (2167)
- D:Gen (2242)

2162 REDUCTION OF BLOOD LIPIDS BY CHOLESTYRAMINE RESIN IN CHRONIC OBSTRUCTIVE JAUNDICE. *(Ger.)* Widmaier, F. (Med. Clin., Stuttgart, Germany) and H. Hiltner. *Z Gastroent* 7(5):390-395, 1969.

Chronic obstructive jaundice was associated with progressively increasing disturbances in lipid metabolism and development of xanthomatosis in a 50-yr old patient. Over a 3 yr-period, total lipids, total cholesterol and phosphatide levels gradually rose to 4200, 1560 and 2530 mg%, resp. Clofibrate and other lipid-lowering agents had no effect on these changes. Treatment with a total dose of 1275 g of cholestyramine, administered over 72 days, reduced total lipids by 65%, total cholesterol by 81% and phosphatide levels by 75% but had no effect on the extent of xanthomatosis. There was a simultaneous improvement in liver function as judged by the levels of serum transaminases and alkaline phosphatase.

2163 COMPATATIVE STUDIES ON THE CLINICAL VALUE OF SERUM QUININEOXIDASE, TRANSAMINASE AND SORBITOLDEHYDROGENASE DETERMINATION FOR THE DEMONSTRATION OF LIVER DAMAGE IN BILIARY CALCULOSIS. *(E.)* Genov, D. (Higher Inst. Med., Sofia, Bulgaria). *Nauch Tr Vissh Med Inst Sofiia* 48(2):7-12, 1969.

A comparison of the clinical value of serum quinineoxidase, transaminase and sorbitolhydrogenase determination for demonstration of liver damage in biliary calculosis was studied in 30 patients, with one group of 14 having no liver damage and another group of 16 having liver damage. Quinineoxidase and alanine-aminotransferase determinations in the serum of patients with biliary calculosis gave almost equal information on liver function, whereas sorbitoldehydrogenase and aspartate-aminotransferase did not give similar results. Serum quinineoxidase determination may give some information on liver changes as a result of biliary calculosis complications and, to a certain degree, the serum quinineoxidase determination is superior to sorbitoldehydrogenase and aspartate-aminotransferase and almost equal to alanine-aminotransferase determination.

2164 OBSERVATIONS ON THE CHEMICAL COMPOSITION OF THE THORACIC DUCT LYMPH IN PATIENTS WITH BILIARY OBSTRUCTION. *(E.)* Forsgren, L. (Karolinska Inst., Stockholm, Sweden). *Acta Chir Scand* 135(7):559-567, 1969.

The chemical composition of thoracic-duct lymph and blood was examined in 14 fasted patients with jaundice due to complete extrahepatic biliary obstruction (generally caused by a malignant tumor) and in nonicteric controls. The distribution of the chemical constituents was expressed as the lymph-to-blood ratio of their respective concentrations. Those ratios for total protein (0.60) and total globulin (0.54) were similar to control values, but the ratio was depressed for albumin (0.67 for the patients and 0.79 for the controls). The ratio was depressed for α_1 globulin (0.70) and elevated for β globulin (0.51). The blood concentrations and lymph-to-blood ratios of sodium (1.0), potassium (0.89), magnesium (0.91), calcium (0.85), phosphoru (0.96), chloride (1.07) and bicarbonate (1.01) were similar to control values. The mean blood concentration of bilirubin in the patients was 19.9 mg/100 ml; the lymph-to-blood ratio for bilirubin was 0.59 for the patients and 0.83 for controls. In the patients and controls, resp., mean blood cholesterol was 346 and 254 mg/100 ml, and the lymph-to-blood ratio 0.26 and 0.46. Mean blood triglyceride concentration was 346 mg/100 ml in the patients and 181 mg/100 ml in the controls; the lymph-to-blood ratio was slightly higher in the patients than the controls. The activities of alkaline phosphatase, GOT and GPT in the blood were 12.6, 107 and 85 U/ml, resp., for the patients and 2.4, 31 and 27 U/ml, resp., for the controls; the corresponding lymph-to-blood ratios were 0.44, 0.44 and 0.45 for the patients and 0.64, 0.73 and 0.73 for the controls.

2165 CALCULOUS BILIARY TRACT DISEASE: AN INCREASING BURDEN ON SURGICAL FACILITIES. *(E.)* Glenn, F. (New York Hosp., New York). *Ann Surg* 171(1):163-164, 1970.

2166 HUMAN GALLBLADDER FUNCTION AFTER SELECTIVE GASTRIC AND TOTAL ABDOMINAL VAGOTOMY. *(E.)* Inberg, M. V. (Dept. Surg., U. Turku, Finland) and M. Vuorio. *Acta Chir Scand* 135(7):625-633, 1969.

2167 JAUNDICE IN A MEDICAL WARD IN SUBTROPICAL AFRICA. *(E.)* Gelfand, M. (Dept. Med., U. Coll. Rhodesia). *S Afr Med J* 698-700, 1969.

2168 SPONTANEOUS VISUALIZATION OF THE RENAL COLLECTING SYSTEMS DURING POST-CHOLEDOCHOTOMY CHOLANGIOGRAPHY: REPORT OF 2 CASES. *(E.)* Petereit, M. R. (Med. X-Ray Ctr., Sioux Falls, S. Dakota). *S. Dakota J Med* 23(1):13-17, 1970.

2169 ACALCULOUS CHOLECYSTITIS IN VIET NAM CASUALTIES. *(E.)* Lindberg, E. F. (USAF Hosp., Lackland AFB, Texas), G. L. B. Grinnan and L. Smith. *Ann Surg* 171(1):152-157, 1970.

2170 EVALUATION OF CONSERVATIVE TREATMENT OF ACUTE CHOLECYSTITIS. *(E.)* Wenckert, A. (Malmo Gen. Hosp., Sweden) and T. Hallgren. *Acta Chir Scand* 135(8):701-706, 1969.

2171 ON THE INTESTINAL EXCRETION OF BILE PIGMENTS IN CHILDREN WITH CONGENITAL BILIARY DUCT ATRESIA. *(Ger.)* Lucking, T. (U. Child. Clin., Freiburg, Germany). *Z Kinderheilk* 107(2):115-121, 1969.

172 OCCLUSION OF THE HEPATIC BILE DUCT IN OLD AGE: AN ANALYSIS OF 157 PATIENTS SUFFER-
NG FROM OBSTRUCTIVE JAUNDICE. *(Ger.)* Beger, H. G.
no affil) and D. Kintzonidis. *Z Gastroent*
(5):396-401, 1969.

173 OBSTRUCTIVE NEONATAL JAUNDICE. *(E.)* Maclaurin, C. H. (Auckland Hosp., New Zea-
and) and J. C. Gillman. *New Zeal Med J*
8(435):77-82, 1968.

2174 INFLUENCE OF THE DIET ON THE PATHOGENESIS OF GALLSTONES. *(It.)* Bonomolo, A. (Hosp.
Central, Rome, Italy), I. Cantarelli, G. Misiti and
M. Marzi. *Chir Gastroent* 2(supp 1):70-75, 1968.

2175 MECHANISM OF SOME CHANGES IN THE WALL OF THE GALLBLADDER IN CHOLELITHIASIS. *(It.)*
Sherrick, J. C. (Northwestern U. Med. Sch., North-
brook, Ill.) and H. Elias. *Epatologia* 15(1):3-7,
1969.

2176 DIAGNOSIS AND TREATMENT OF BILIARY TRACT INFLAMMATION. *(It.)* Sanguigni, S. (Inst. Clin. Med. Med. Ther., U. Rome, Italy), G. Lococo, F. Marchio and R. Rapisarda. *Epatologia* 14(6):531-543, 1968.

2177 THE MANAGEMENT OF BILIARY CYSTS. *(E.)* Kune, G. A. (Roy. Melbourne Hosp., Australia) and G. McKenzie. *Aust New Zeal J Surg* 39(2):132-137, 1969.

2178 TUMOR OF THE AMPULLA OF VATER. *(It.)* Puntillo, F. (St. Giovanni Hosp., Italy), L. Moscati and C. Fani. *Ann Ital Chir* 45(2):257-302, 1969.

2179 THE VOMITING OF GALLSTONES: REPORT OF A CASE. *(E.)* Taylor, P. J. (Tucson Clin., Arizona) and H. P. Limbacher. *Amer J Dig Dis* 15(1):73-78, 1970.

2180 TRANSHEPATIC CHOLANGIOGRAPHY. *(It.)* Truini, F. (Civil Hosp., Imperia, Italy) and S. Novaro. *Fegato* 15(2):223-227, 1969.

2181 THORIUM DIOXIDE ANGIOGRAPHY FOLLOWED BY BILE DUCT CARCINOMA: A CASE REPORT WITH RADIOLOGICAL STUDIES. *(E.)* Katayama, H. (Hosp. St. Raphael, New Haven, Conn.), S. Sawada, H. Yoshinaga and W. J. Russell. *Nippon Acta Radiol* 29(5):481-490, 1969.

2182 COMMON DUCT DIAPHRAGM. *(E.)* Guthrie, R. H. (New York, N. Y.) and M. I. McClain. *Med Bull U S Army Europ* 26(11):342-343, 1969.

2183 FAMILIAL BILIARY FIBRO-ANGIO-ADENOMATOSIS WITH CHRONIC ICTERUS. *(Fr.)* Sudre, Y. (Poitiers, France), J. Beauchant, J. M. Payard and J. Payen. *Arch Franc Mal Appar Dig* 58(10-11):675-688, 1969.

2184 STUDIES ON BILIRUBIN GLUCURONIDE. II. A STUDY ON CONJUGATED BILIRUBIN FRACTION IN BILE AND BILIRUBIN GLUCURONIDE. *(Jap.)* Takagi, M. (Okayama U. Med. Sch., Japan). *Acta Med* 39(3):265-274, 1969.

2185 CHOLECYSTIC CARCINOMA. *(It.)* Truini, F. (Civil Hosp., Imperia, Italy) and F. Banchero. *Fegato* 15(2):213-221, 1969.

2186 INTRAHEPATIC CHOLESTASIS DUE TO 6-MERCAPTOPURIN. *(Ger.)* Lehmann, G. W. (St. Hosp., Dresden, Germany). *Kinderaerztl Praxis* 37(11):506-511, 1969.

- P:Motil (1649)
- Diagproc (1806)(1807)(1810)(1813)(1816)(1819)(1820)
- D:Stomduo (1867)
- D:S.Intest (1940)(1941)(1956)
- D:Pancreas:Pancreat (2027)
- D:Livbil (2062)(2071)
- D:Livbil:A.Nonv.Hep (2089)
- D:Livbil:Cirrh (2130)

2187 AN INVESTIGATION OF TRAVELLER'S DIARRHEA. *(E.)* Rowe, B. (Central Pub. Hlth. Lab., Colindale, London, England), J. Taylor and K. A. Bettleheim. *Lancet* 1(7636):1-5, 1970.

British troops who travelled from England to Aden by air were studied to determine what proportion of cases of travellers' diarrhea was due to *shigellae* and *salmonellae,* and to study any association between other bacterial groups and diarrhea. Of 540 newly arrived soldiers, 96 had acute diarrhea during their first 6 weeks in Aden, (38 of them during their first 14 days after arrival). Using fecal specimens from 35 of these early cases, *salmonellae* were isolated from 2, but in the remaining 33 *salmonellae* and *shigellae* were not isolated. A new serotype of *Escherichia coli* with antigenic structure 0148K?H28 was isolated in the acute phase from 19 persons. In the remaining 14 cases a number of different *E. coli* serotypes were isolated, including serotypes which cause infantile diarrhea (not related to travellers' diarrhea). The peak of the isolations of *E. coli* 0148K?H28 corresponded with the peak incidence of traveller's diarrhea, and this serotype was never isolated from a healthy subject. A year later, in a laboratory in England, a technician working with this serotype developed a severe attack of diarrhea, and *E. coli* 0148K?H28 was recovered in pure culture from his stools. This serotype has not been found in over 5000 strains of *E. coli* isolated from human and animal sources in Great Britain. On arrival in Aden it is likely that travellers on first contact with this pathogenic serotype had no immunity to it and developed diarrhea. At different times (or in other areas) other serotypes of *E. coli* may be associated with travellers' diarrhea.

2188 PLASMA VOLUME EXPANSION IN PORTAL HYPERTENSION. *(E.)* Maddrey, W. C. (Johns Hopkins Ctr. Med. Res. Training, Calcutta, India), J. L. Boyer, N. N. Sen, J. Thomas, A. K. Basu and F. L. Iber. *John Hopkins Med J* 125(4):171-183, 1969.

Eighty-seven patients with portal vein obstruction, exhibited a significant increase in plasma volume (Evans blue dye dilution method), compared with 67 normal control subjects. An analysis was made of the factors contributing to the elevated plasma volume by measuring red cell mass, total blood volume, intrasplenic pressure and by studying liver function. There was a significant elevation of plasma volume in patients with portal hypertension regardless of the site of obstruction to portal flow. Red blood cell mass (measured with Cr^{51}) was normal in patients with portal hypertension and the blood volume elevation was due to plasma volume expansion. Patients with extrahepatic portal venous obstruction and with normal liver function and normal liver histology had an elevation of plasma volume equal to that in patients with post-necrotic cirrhosis and impaired liver function. There appears to be a mechanical cause for plasma volume increase in portal hypertension.

2189 CIRRHOTIC HYDROTHORAX: FURTHER EVIDENCE THAT AN ACQUIRED DIAPHRAGMATIC DEFECT IS AT FAULT. *(E.)* Lieberman, F. L. (John Wesley County Hosp., Los Angeles, Calif.) and R. L. Peters. *Arch Intern Med* 125(1):114-117, 1970.

An autopsy report is described of diaphragmatic lesions in 4 patients with cirrhotic hydrothorax. A right-sided pneumothorax had promptly developed in 2 patients when diagnostic pneumoperitoneum was performed while they were alive. Two patients had 1 mm openings in the tendinous portion of the diaphragm, not covered by blebs or "blisters", through which fluid readily leaked from the peritoneal cavity and 3 patients had a blister-like formation on the pleural surface of the diaphragm evident before hydrostatic pressure was increased. These "blisters" ballooned and leaked when the abdominal fluid pressure was increased, demonstrating a communication between the peritoneal and pleural cavities. The peritoneal surface of the diaphragm in all instances showed a separation of the collagenous bundles in the tendinous portion, to permit the defect. This study brings the number of published cases of cirrhotic hydrothorax demonstrating either diaphragmatic blebs or openings at autopsy, to 10. The physical appearance of the diaphragmatic aperture suggests that the pressure of ascites causes separation of the taut collagenous fibers of the tendinous portion of the diaphragm to the extent that the thin serosal lining becomes evaginated into the thoracic cavity. Repeated thoracocenteses may tend to prevent closure of the defect by creating a constant pressure differential between the abdominal and thoracic chambers; whereas paracentesis, or preferably diuresis, may allow fibrous healing of these defects.

2190 BACTERIAL FLORA ASSOCIATED WITH THE HUMAN GASTROINTESTINAL MUCOSA. *(E.)* Nelson, D. P. (Inst. Nutr. Central Amer. Panama, Guatemala) and L. J. Mata. *Gastroent* 58(1):56-61, 1970.

Bacterial flora associated with healthy and diseased gastric and intestinal mucosa of man were studied by several bacteriological and histological techniques. Homogenates of healthy gastric and duodenal tissue did not contain bacteria but homogenates of healthy jejunal, colonic and appendiceal tissue contained bacteria (predominately anaerobic), in concentrations of 10^4 to 10^6 per g tissue, which were embedded in mucous linings. Homogenates of gastric and duodenal tissue from patients with gastric carcinoma contained bacteria (anaerobic and aerobic) in concentrations of 10^5 and 10^6 per g tissue; these bacteria were not observed histologically in mucous lining. Homogenates of colonic tissue from patients with Hirschsprung's disease contained aerobic and anaerobic bacteria in concentrations of 10^4 to 10^8 per g tissue which were embedded in the mucous lining. The most common types of bacteria in healthy and diseased tissue, in order of frequency, were: gram-positive bacilli, gram-positive cocci, and gram-negative bacilli.

191 BILE ACID TRANSFORMING MICRO-ORGANISMS IN RATS WITH AN INTESTINAL BLIND SEGMENT.

E.) Midtvedt, T. (Capt. W. Wilhelmsen og Frues
acteriol. Inst., Oslo, Norway), A. Norman and K.
ygaard. *Acta Path Microbiol Scand* 77(1):162-166,
969.

he number of bile acid transforming intestinal mi-
ro-organisms was determined in adult male rats with
blind jejunal segment. In operated rats, the
otal number of microbes was 10^9-10^{11} in the blind
egment, ileum and cecum, and in control rats, the
umber of anaerobic micro-organisms was 10^7-10^8 in
he blind segment, 10^8-10^9 in the ileum, and 10^9-
0^{10} in the cecum. Values obtained aerobically for
perated and control rats were at least one dilution
tep lower in all cases except one. There was a
istinct increase of organisms capable of splitting
lycine and taurine conjugates, eliminating the hy-
roxyl group at C-7 of the bile acid, and oxidizing
he hydroxyl groups at C-3 and C-7 to keto groups,
n the blind segment and the ileum of the operated
ats as compared to controls. Micro-organisms capa-
le of oxidizing the hydroxyl group at C-3 were not
emonstrated in jejunum contents from control rats
nd in ileum contents from one control rat, but were
resent in ileum contents from two control rats and
n the cecum contents from all control rats. 7 α-
ehydroxylating organisms in control rats were ab-
ent or present in small numbers in the jejunum and
leum contents, but were always present in cecum
ontents. All types of micro-organisms were present
n varying numbers in all intestinal contents.

2192 INTESTINAL MICROFLORA IN ASIATIC CHOLERA: I. "RICE-WATER" STOOL.

(E.) Gorbach, S. L. (Johns Hopkins Ctr. Med. Res. Train., Calcutta, India), J. G. Banwell, B. Jacobs, B. D. Chatterjee, R. Mitra, K. L. Brigham and K. N. Neogy. *J Infect Dis* 121(1):32-37, 1970.

Culturable fecal flora were measured, using samples from 17 male adults with cholera, all of whom were passing copious "rice-water" stool and showing signs of moderate to severe dehydration on admission. The cholera "rice-water" stool contained most components of the normal flora although in reduced concentrations. Anerobes were especially affected, and in some patients were virtually absent. The microorganism of fecal effluent was almost entirely vibrio cholerae. The most predominant microorganisms in the 17 patient sample was as follows: vibrios (11), coliforms (3), bacteroides (2), and streptococci (1) (vibrios was at least the 2nd most prevalent organism in all cases). The concentration of vibrios in acute cases ranged from 10^5/ml to 10^8/ml. There was no correlation between vibrio counts and clinical or physiological parameters. Sequential fecal examinations from single cases showed gradual restoration of normal microbial populations by the 4th to 8th day. During this period the numbers of vibrios progressively declined. Rapid colonic transit and changes in the physiochemical environment may account for the diminished anerobes during the acute period.

2193 INTESTINAL MICROFLORA IN ASIATIC CHOLERA: II. THE SMALL BOWEL.

(E.) Gorbach, S. L. (Johns Hopkins U. Ctr. Med. Res. Training, Calcutta, India), J. G. Banwell, B. Jacobs, B. D. Chatterjee, R. Mitra, K. L. Brigham and K. N. Neogy. *J Infect Dis* 121(1):38-45, 1970.

Multiple small bowel intubations were performed in 17 male adults with acute cholera. Vibrios were found throughout the gastrointestinal tract, from mounth to anus; 10^5/ml in the small bowel, 10^6/ml in the stool. These organisms were found in saliva 3 days after the last episode of vomiting. Concentrations of *V. cholerae* in discharges from the gall bladder were no greater and often were lower than in small bowel fluid. Vibrio clearance from the small bowel occurred 4 to 8 days after onset and appeared to be unrelated to indigenous microflora. The numerical concentration of vibrios in the small bowel bore no relationship to clinical or physiological parameters. Components of the normal flora were present with vibrios in all areas of the small bowel. Abnormal persistence of coliforms in the jejunum was noted in 8 of 10 patients, and in 1 patient these organisms remained for at least 5 months. Oral tetracycline therapy resulted in prompt reductions in vibrios within the small bowel in 3 of 4 patients. However, 1 patient continued to show abnormal mucosal fluid secretion despite the absence of vibrios, suggesting that the effects of "cholera-toxin" may persist for many hours. An attempt to disrupt vibrio concentrations by implantation of a benign strain of *Escherichia coli* was unsuccessful. Characteristic normal intestine microecology seems to be altered during this infection; the small bowel is contaminated by colonic bacteria (coliforms), and the large bowel tends to lose its unique bacterial populations, the anaerobes.

2194 SMALL INTESTINAL LESION OF CHRONIC DIARRHEA AND MARASMUS IN IRAN.

(E.) Creamer, B. (St. Thomas Hosp., London, England), W. Dutz and C. Post. *Lancet* 1(7636):18-20, 1970.

Chronic diarrhea and marasmus are common among the well-fed infants that often die from infection in an orphanage in Shiraz, in South Iran. The small intestine of 11 infants (2-1/2 to 6-1/2 months of age) dying of chronic diarrhea and marasmus were examined postmortem. All showed gross abnormalities throughout most of the small bowel, identical to those found in sprue (although tropical sprue is unknown in the area). In 3 cases there were moderate changes in villous structure; others showed severe changes (mucosa was flattened on the mucosal folds and low ridges were present between the folds). Known bacterial infection and parasitic infestation were inconsistent. With this lesion severe malabsorption is inevitable. The consequences of this lesion in later life are not known, but since lymphoma of the small bowel is common in Iran an analogy to celiac disease and malignancy is possible.

2195 BACTERIAL AND PARASITIC FINDINGS IN DIARRHEA IN THE YOUNG: A STUDY OF 500 CONSECUTIVE UNTREATED CASES IN NEW DELHI. *(E.)* Abraham, T. (Med. Coll., Kottayam, Kerala, India), S. N. Saxena and R. Sen. *Indian Pediat* 6(7):476-482, 1969.

A study of the microbial etiology of specimens of feces from 500 consecutive untreated cases of diarrhea in New Delhi, India, revealed the presence of a cellular exudate in 424 (84.8%) stool specimens, while actual presence of pathogenic bacteria or evidence of parasitic infection was found in only 144 (28.8%) specimens. The protozoan, Giardia intestinalis, was present in 45 (9.0%) specimens and evidence of helminthic infestation (Ascaris, hookworm, Hymenolepis) was seen in 19 samples. Bacterial findings revealed 36 *Escherichia coli* serotypes, 25 *Shigella* serotypes, 19 *Providence* serotypes, and 7 *Salmonella* serotypes.

2196 ISLET-CELL ADENOMA OF THE PANCREAS WITH REVERSIBLE WATERY DIARRHEA AND HYPOKALEMIA. *(E.)* Lopes, V. M. (Lisbon Med. Sch., Portugal), D. D. Reis and A. B. Cunha. *Amer J Gastroent* 53(1):17-35, 1970.

2197 HYPOGLYCEMIA IN CHILDREN WITH KWASHIORKOR. *(E.)* Wharton, B. (Inst. Child. Hlth., London, England). *Lancet 1* (7639):171-173, 1970.

2198 EPIDEMIOLOGY OF VIRAL HEPATITIS IN ACCRA, GHANA. *(E.)* Morrow, R. H. (Natl. Inst. Hlth., U.S.A.; Natl. Inst. Hlth. Med. Res., Ghana; Joint Res. Prog., Accra, Ghana), F. T. Sai, J. H. Edgcomb and H. F. Smetana. *Trans Roy Soc Trop Med Hyg* 63(6):755-767, 1969.

2199 THE FECAL SMEAR IN THE THERAPY OF DIARRHEAS. *(E.)* Wolff, H. L. (Inst. Trop. Med., Leyden U., Netherlands). *Trop Geogr Med* 21(4):427-435, 1969.

2200 BACTERIOLOGY OF DIARRHEA IN SUDANESE CHILDREN. *(E.)* Erwa, H. H. (Fac. Med., U. Khartoum, Sudan). *J Trop Med Hyg* 72(11):261-264, 1969.

2201 DIFFERENTIAL DIAGNOSIS AND THERAPY IN DIARRHEA. *(Ger.)* Demling, L. (U. Med. Clin., Erlangen, Germany). *Deutsch Med J* 20(22):688-691, 1969.

2202 ZOLLINGER-ELLISON SYNDROME: TWO CASES. *(Sp.)* Olavarrieta, L. (Prov. Hosp., Valencia, Spain), B. Narbona and E. Molina. *Med Espanola* 62(365):140-145, 1969.

2203 THE USE OF FH 049-E (DIPHENOZYLATE) FOR THE TREATMENT OF DIETARY DIARRHEA. *(Fr.)* Martin, C. (Bordeaux, France). *Bordeaux Med* 2(11):2511-2518, 1969.

2204 PRACTICAL FECAL ANALYSIS IN THE DIFFERENTIAL DIAGNOSIS OF CHRONIC DIARRHEA. *(Fr.)* Demole, M. (Cantonal Hosp., Geneve, Switzerland). *Rev Med Suisse Rom* 89(11):1067-1074, 1969.

2205 ANESTHESIA AND RESUSCITATION DURING AN INTESTINAL TRANSPLANT. *(Fr.)* Baur, O. (Hosp. Hotel-Dieu, Paris, France), R. Assan, J. Roux, V. Radoman and Ch. Olivier. *J Chir* 98(4):349-356, 1969.

2206 RESEARCHES ON THE DIGESTIVE APPARATUS IN PREMATURE AGING. *(Fr.)* Nicolae, D. (Geriat. Inst., Bucarest, Rumania), D. Hatmanu, Z. Dumitrescu and I. Bojinescu. *Rev Franc Geront* 15(5):277-279, 1969.

2207 THE USE OF VAGOTOMY IN THE TREATMENT OF MASSIVE ULCERATED HEMORRHAGES. *(Fr.)* Adloff, M. (CHU, Strasbourg, France) and J. J. Kohler. *Presse Med* 77(49):1813-1814, 1969.

2208 IMPORTANT PRINCIPLES OF REANIMATION IN ACUTE INTESTINAL OCCLUSION. *(Fr.)* Levy, E. (Hosp. Rothschild, Paris, France). *Rev Prat* 19(32):4719-4729, 1969.

2209 CLINICAL STUDY OF INSIDON IN GASTROENTEROLOGY. *(Fr.)* Sambin, M. P. (Hosp. Lyon, France). *J Med Lyon* (1176):1691-1694, 1969.

2210 ZOLLINGER-ELLISON SYNDROME IN A PATIENT WITH SECONDARY AMENORRHEA: REPORT OF A CASE WITH FATAL OUTCOME. *(E.)* De Neef, J. C. (Dijkzigt Hosp., Rotterdam Med. Sch., Netherlands), G. H. Krull, J. Vonk, A. K. Vos and J. Bool. *Fertil Steril* 21(1):43-63, 1970.

2211 ACUTE SUPERIOR MESENTERIC ARTERY SYNDROME IN THE SEVERELY BURNED PATIENT. *(E.)* Wallace, R. G. (Martin Army Hosp., Columbus, Ga.) and W. B. Howard. *Radiology* 94(2):307-310, 1970.

2212 MESENTERIC PLICATION (CHILDS-PHILLIPS OPERATION). *(Fr.)* Cornil, A. (Clin. St. Joseph, Liege, Belgium), L. Lewalle and C. Dreze. *Acta Gastroent Belg* 32(10):725-738, 1969.

2213 ALTERATIONS IN CARBOHYDRATE METABOLISM IN JAMAICAN CHILDREN WITH SEVERE MALNUTRITION. *(E.)* Alleyne, G. A. O. (Trop. Metab. Res. Unit, U. West Indies, Jamaica) and G. H. Scullard. *Clin Sci* 37(3):631-642, 1969.

214 WHITHER GASTROENTEROLOGY? *(E.)* Farrar, J. T. (Editor, Amer. J. Dig. Dis., Harper Row, New York). *Amer J Dig Dis* 15(1):1-6, 1970.

215 ANTIBACTERIAL ACTIVITY OF RIFAMPICIN ON FECAL FLORA IN RATS. *(It.-E.)* Bertazzoni, . (Dept. Pharmacol., U. Bologna, Italy), G. P. elo, G. Vettori and T. Berti. *Antibiotica* (3):125-133, 1968.

216 CHEMOTHERAPY FOR CANCER OF THE DIGESTIVE APPARATUS. *(Sp.)* Arraztoa, J. (Hosp. lin., Catholic U. Chile, Valparaiso), B. Duran, R. aeza and C. I. Echeverria. *Rev Med Valparaiso* 2(4):262-267, 1969.

217 ASSOCIATION OF THROMBOSIS OF THE INFERIOR VENA CAVA AND OF THE PORTAL VEIN: CAVO-ORTAL THROMBOPHLEBITIS: CLINICAL CONTRIBUTION AND URGICAL PROBLEMS. *(It.)* Fegiz, G. (Dept. Surg., . Rome, Italy), L. Gioffre, A. Trenti and M. C. asella. *Chir Gastroent* 2(supp 1):85-95, 1968.

218 LYMPHATIC CYST OF THE MESENTERY COMPLICATED BY A PSEUDO-APPENDICULAR SYMPTOMATOLOGY. *It.)* Antonucci, G. (Hosp. Central, Rome, Italy), . Malatesta and M. Marzi. *Chir Gastroent* (supp 1):137-146, 1968.

219 A RADIOLOGIC CLUE TO INTESTINAL INFARCTION -- PORTAL VENOUS GAS. *(E.)* irschfield, J. S. (U. Louisville Sch. Med., Ky.), . P. Lacy and R. J. Sayers. *J Kentucky Med Ass* 8(1):35-37, 1970.

2220 MICROBIAL ROLE IN DIARRHEAL DISEASES IN INFANCY AND CHILDHOOD. *(Th.)* Kongsamran, S. (Siriraj Hosp., Bangkok, Thailand) and R. Harapongse. *Siriraj Hosp Gaz* 21(2):151-156, 1969.

2221 THE EPIDEMIOLOGY OF GASTROENTERITIS IN INFANCY: PART II. *(E.)* Spencer, I. W. F. (City Hlth. Dept., Johannesburg, S. Africa) and M. E. E. Coster. *S Afr Med J* 43(47):1438-1442, 1969.

2222 MAGNESIUM IN THE THERAPY OF OROFACIAL LESIONS OF SEVERE PROTEIN-CALORIE MALNUTRITION. *(E.)* Caddell, J. L. (Dept. Biochem. Pediat., St. Louis U. Sch. Med., Mo.). *Brit J Surg* 56(11):826-828, 1969.

2223 INFANTILE GASTROENTERITIS IN ADDIS ABABA: A CLINICAL AND BIOCHEMICAL STUDY OF 50 CASES. *(E.)* Lofdahl, E. (Fac. Med., Haile Sellassie U., Addis Ababa, Ethiopia), Y. Larsson and M. Persson. *Ethiopian Med J* 7(2):89-102, 1969.

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2225 AN ATTEMPT TO ESTABLISH EXPERIMENTAL DYSENTERIC BACILLI CYSTITIS. *(E.)* Awataguchi, S. (Biol. Res. Lab., Tanabe Seiyaku Co., Ltd., Toda, Saitama, Japan), Y. Kawano, A. Kojima and S. Sakuma. *Jap J Microbiol* 13(4):325-333, 1969.

2226 EXPERIENCE WITH FURAZOLIDONE IN THE TREATMENT OF ENTERIC FEVER. *(E.)* Kamat, G. R. (M. G. M. Hospital, Bombay, India), D. Bulchandani and P. H. Katrak. *J Ass Physician India* 17(10):615-620, 1969.

2227 A STUDY OF 200 CASES OF ACUTE DIARRHEA IN ADULTS. *(E.)* Rao, S. V. (Osmania Med. Coll., India), K. Rajyalaxmi, G. R. Mohan and V. P. Chandrasekar. *J Ass Physician India* 17(10):591-597, 1969.

2228 STUDIES OF DIARRHEAL DISEASES IN IRAN: I. OCCURENCE OF BACTERIAL INFECTION IN PRE-SCHOOL CHILDREN ON THE CENTRAL PLATEAU OF IRAN. *(E.)* Mohadjer, S. (Sch. Publ. Hlth., Teheran U., Iran) and K. Badalian. *J Trop Med Hyg* 72(11):265-270, 1969.

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2232 CHANGING FECAL POPULATION OF *ESCHERICHIA COLI* IN HOSPITAL MEDICAL PATIENTS. *(E.)* Cooke, E. M. (St. Bartholomew's Hosp., London, England), S. Ewins and R. A. Shooter. *Brit Med J* 4(5683):593-595, 1969.

2233 MALNUTRITION AND INFECTIOUS DISEASES -- THE "SURVIVING CHILD". *(E.)* Bengoa, J. M. (W. H. O., Geneva, Switzerland). *Biotech Bioeng Symp* 1:253-276, 1969.

2234 THE EPIDEMIOLOGY OF GASTROENTERITIS IN INFANCY: PART I. *(E.)* Spencer, I. W. F. (City Hlth. Dept., Johannesburg, S. Africa) and M. E. E. Coster. *S Afr Med J* 43(46):1391-1397, 1969.

2235 DIAGNOSTIC PROBLEMS OF ZOLLINGER-ELLISON SYNDROME WITHOUT ULCER: WITH REGARDS TO A NEW OBSERVATION. *(Fr.)* Mercadier, M. (Hosp. La Pitie, Paris, France), J. J. Bernier, D. Melliere, J. P. Clot, J. C. Bognel, J. M. Hay and F. Jacquin. *Sem Hop Paris* 45(52):3362-3369, 1969.

2236 TRAVELLERS' DIARRHEA. *(E.)* anon. *Lancet 1* 1(7636):27-28, 1970.

2237 TRAVELLERS' DIARRHEA. *(E.)* Marsh, F. (Palmer's Hill, Epping, Essex, England). *Lancet 1* 1(7638):147, 1970.

2238 TREATMENT OF DEHYDRATION IN DIARRHEA. *(Sp.)* Cardesa, J. J. (U. Clin. Pediat., Seville, Spain). *Rev Esp Pediat* 25(149):619-626, 1969.

2239 COPROLOGIC EXAMINATION BY THE TECHNIQUE OF WASHED FECES APPLIED IN THE STUDY OF TRICHOCEPHALUS EGGS IN SARDINIA. *(It.)* Adamo, F. (Inst. Clin. Med. Med. Ther., M. Aresu, U. Cagliari, Italy), A. Medda, C. Caddia and A. Curreli. *Rass Med Sarda* 72(3):175-180, 1969.

2240 TOTAL GASTRECTOMY FOR MALIGNANT ZOLLINGER-ELLISON SYNDROME. *(E.)* Thorbjarnson, B. (New York Hosp., N. Y.) and F. D. Zahn. *New York J Med* 70(2):316-318, 1969.

2241 HOSPITAL INCIDENCE OF CARCINOMA OF THE GASTROINTESTINAL TRACT. *(E.)* Sung, J. L. (Natl. Taiwan U. Hosp., China), S. C. Hsu, J. Y. Yu, L. T. Wang, C. N. Lien and T. H. Wang. *J Formosan Med Ass* 68(9):478-485, 1969.

2242 ON SOME POSSIBLE MECHANISMS FOR THE GENESIS OF PORTAL HYPERTENSION IN CHRONIC HEPATITIS AND LIVER CIRRHOSIS. *(E.)* Safirescu, T. (U. Hosp. Bucarest, Rumania), T. Ghitescu, S. Tacorian and G. Petruc. *Rev Int Hepat* 19(5):283-290, 1969.

2243 A METHOD FOR COUNTING SCHISTOSOME EGGS IN FECES. *(E.)* Barbosa, F. S. (Fac. Med., Fed. U., Pernambuco, Brazil). *Rev Inst Med Trop S Paulo* 11(6):442-443, 1969.

2244 SCHISTOSOMAL PIGMENTS IN MURINE HEPATIC BILHARZIASIS. *(E.)* Ramadan, M. A. (Med. Res. Inst., Alexandria, UAR) and A. I. Michael. *Acta Histochem* 34(2):238-245, 1969.

2245 GASTROINTESTINAL BILIARY CONDITIONS. *(E.)* Orloff, M. J. (La Jolla, Calif.). *Surg Gynec Obstet* 130(2):298-301, 1970.

2246 ORAL METHOTREXATE THERAPY OF GASTROINTESTINAL CARCINOMA. *(E.)* Moertel, C. G. (Mayo Clin. Found., Rochester, Minn.), R. J. Reitemeier and R. G. Hahn. *Surg Gynec Obstet* 130(2):292-294, 1970.

2247 SOME CHARACTERISTICS OF RECENT DYSENTERY EPIDEMICS OCCURRING IN SHIMA ISLETS, MIE PREFECTURE. *(Jap.)* Atsumi, M. (Mie Publ. Lab., Mie Prefecture, Japan), H. Yoshikawa, M. Noro and S. Nishioka. *J Jap Ass Infect Dis* 43(4):75-79, 1969.

2248 INTESTINAL NEUMATOSIS IN AN ADULT. *(Sp.)* Villasenor, M. S. (Gen. Hosp., C. M. La Raza, I.M.S.S., Mexico). *Cir Cir* 37(5):373-388, 1969.

2249 PERITONITIS OF PYELORENAL ORGIN. *(Sp.)* Perdomo, R. (Fac. Med., Montivideo, Uruguay). *Rev Cir Uruguay* 38(1-2):69-76, 1968.

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- D:Stomduo (1883)
- D:Stomduo:Peptulc (1902)
- D:S.Intest (1957)
- D:L.Intest (1972)(1973)(1980)
- D:Livbil (2058)(2066)(2074)(2081)
- D:Livbil:Cirrh (2134)

2250 JUXTA-INTESTINAL CYSTIC SCHISTOSOMA GRANULOMA. *(E.)* Grace, H. (Fac. Med., Cairo U., Egypt) and S. A. Wassef. *J Path* 99(2):176-179, 1969.

The presence of a juxta-intestinal schistosomal cyst in a 34-yr-old male patient was studied hematologically, radiologically, surgically, and microscopically. At presentation there was a rounded, well-defined fixed mass in the right iliac fossa, urine was normal and neither urine nor stools showed schistosome ova. A barium enema showed the cecum to be lying horizontally and pointing medially, with a smooth semicircular big filling defect on its inferior surface. At laparotomy a well-defined cystic mass was removed and was later identified as a large, multilocular schistosomal granuloma.

2251 QUANTITATIVE COMPARISON OF THE INTENSITY OF *SCHISTOSOMA MANSONI* INFECTIONS IN MAN AND EXPERIMENTAL ANIMALS. Cheever, A. W. (Natl. Inst. Hlth., Bethesda, Md.). *Trans Roy Trop Med Hyg* 63(6):781-795, 1969.

A study of the intensity of *S. mansoni* infections in different species including man, was conducted using a standard NIH strain (of Puerto Rican origin) of *S. mansoni* as the infecting organism and mice, monkeys and chimpanzees as the experimental hosts (data from human subjects was obtained from cadavers). The concentration of eggs per gram of tissue was used as the primary standard for comparison of infection intensity in different host species, and the number of worm pairs per kilogram of body weight was considered in relation to egg concentration. In man and mice infected with *S. mansoni*, a steady state developed in which the rates of deposition and destruction of parasitic eggs in the tissue are nearly equal. The concentration of eggs per gram of tissue in mice is 75 times higher in mice infested with a single worm pair than in the most heavily infested human subjects. The number of eggs per gram of tissue of human subjects and animals is proportional to the number of worm pairs per kilograms of body weight. In man the intensity of infection is seldom greater than 5 worm pairs per kilogram of body weight, while in the experimental animals, and especially in mice, it is seldom less than 50 worm pairs per kilogram of body weight. Quantitative comparison of schistosomal infections between species is meaningful if the number of eggs in the tissues is considered in terms of both total number and concentration.

2252 TREATMENT OF *TAENIA SAGINATA* AND *HYMENOLEPIS NANA* INFECTIONS WITH PAROMOMYCIN. *(E.)* Salem, H. H. (U. Mosul, Iraq) and G. El-Allaf. *Trans Roy Soc Trop Med Hyg* 63(6):833-836, 1969.

2253 INFECTION WITH *SCHISTOSOMA INTERCALATUM* IN MUNGO DEPARTMENT, CAMEROON. *(E.)* Van Wijk, H. B. (Protestant Hosp., N'doungue, Cameroon). *Trop Geogr Med* 21(4):362-374, 1969.

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- P:Gen (1794)
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DESCRIPTION OF INDEXES

SUBJECT and AUTHOR INDEXES for Gastroenterology Abstracts and Citations, Volume 5, are produced from on-line computer print-out of key-punched cards.

The SUBJECT INDEX is based on a hierarchial system of classification in which *major index terms* are modified by one or more *key word descriptors*. The *key word descriptors* are listed in decreasing order of importance and describe the content of the abstract or citation. In addition, in this indexing system, some *key word descriptors* will also be used as *major index terms*, thus providing in-depth indexing of each document. An abstract or citation number, in brackets, will be found after the *key word descriptors*. Abstracts will be identified by an asterisk outside of the brackets.

An illustrative example of this indexing system follows:

INTESTINE, LARGE

Colon, Carcinoma, Radiological Detection, Rectum (0188)*

COLON

Cancer, Polyps, Radiological Detection (0188)*

RECTUM

Cancer, Polyps, Precancerous (0188)*

CANCER

Large Intestine, Detection, Radiology (0188)*

DIAGNOSIS

Radiology, Cancer, Large Intestine (0188)*

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  - ZINC, LACTOSE, RETENTION (1642)
- ACID-BASE BALANCE
  - LIVER, CIRRHOSIS, PERFUSION (2136)
- ACIDITY
  - PH CHANGE, CARDIAC SPHINCTER, DIGESTION (1613)
- ACINAR CELL
  - PANCREAS, EXOCRINE FUNCTION, ULTRASTRUCTURE (1580)*
- ADENOMA
  - ISLET CELL, HYPERINSULINISM, DIAGNOSIS, SURGERY (2019)
  - ISLETS OF LANGERHANS, PANCREAS, DIARRHEA (2176)
  - PAPILLARY, VILLOUS, APPENDIX (1979)
- ADHESION
  - POSTOPERATIVE, MESENTERIC PLICATION (2212)
- ADRENALECTOMY
  - LIVER, DRUG METABOLISM, ENZYME ACTIVITY (1773)
- ADRENERGIC BLOCKING AGENT
  - GASTRIC SECRETION, LIPOPOLYSACCHARIDE, INHIBITION (1666)*
- ALBUMIN
  - LIVER, SYNTHESIS (1699)*
  - LYMPH COMPOSITION, THORACIC DUCT, BILIARY OBSTRUCTION, LYMPH-TO-BLOOD RATIO (2164)*
- ALCOHOL
  - C-19 STEROID ALLYLIC, EPIMERISATION, LIVER, RAT (1739)
  - FATTY LIVER, REGENERATION, ABSTINENCE (2152)
- AMEBIASIS
  - BENTONITE FLOCCULATION TEST, SEROLOGIC DIAGNOSIS (2267)
  - HEPATITIS, SURGERY (1742)
  - INTESTINE, ANTIBIOTIC (2263)
  - LIVER, HEPATITIS, ABSCESS (2089)
  - LIVER, HEPATITIS, ABSCESS, CONNECTIVE TISSUE (2099)
  - LIVER ABSCESS, PERICARDITIS (2074)
  - PARASITE, HEPATIC ABSCESS, LIVER SCAN (2100)
  - TREATMENT, ANTIBODY LEVEL (2261)
- AMINO ACID
  - ALANINE, HEPATIC GLUCONEOGENESIS, STARVATION, MAN (1719)*
  - CHOLESTYRAMINE, BILE ACID, CHOLELITHIASIS, HAMSTER, MAN (1770)
  - INCORPORATING SYSTEM, ENZYME INHIBITORY EFFECTS, RAT, LIVER (1749)
  - MICROSOME, LIVER, PEPTIDE (1741)
  - NET ABSORPTION, CYSTINURIA, TRANSPORT DEFECT (1963)*
  - SMALL INTESTINE, JEJUNUM, ACTIVE TRANSFER (1787)*
  - TRANSPORT, INTESTINAL MUCOSA, ATPASE, CARDIOACTIVE STEROIDS, RAT (1639)
  - TYROSINE, METABOLISM, LIVER, RAT (1736)
- AMPULLA OF VATER
  - CARCINOMA (2178)
- ANASTOMOSIS
  - COLON, TUMOR IMPLANTATION, RAT (1978)
- ANATOMY
  - LIVER, MAN (2057)
- ANEMIA
  - HOOKWORM, IRON DEFICIENCY, VITAMIN B12 (2258)
- ANESTHESIA
  - LIVER, HISTOCHEMISTRY, RNA (1584)
  - POTENCY, GASTRIC SECRETION, CHLORIDE ION SOLUTIONS, FROG (1681)
  - SMALL INTESTINE, SURGERY (2205)
  - SUXAMETHONIUM, FASCICULATION, INTRAGASTRIC PRESSURE (1654)
- ANGIOGRAPHY
  - GALLBLADDER, RADIOLOGY, DIAGNOSIS, CANCER (1807)*
  - STOMACH, DIAGNOSIS, RADIOLOGY, MARKER STUDIES (1800)*
- ANGIOTENSIN
  - CIRRHOSIS, ANGIOTENSINASE, ENZYME ACTIVITY (1706)*
- ANGIOTENSINASE
  - ANGIOTENSIN, ENZYME ACTIVITY, EXPERIMENTAL CIRRHOSIS (1706)*
- ANTHELMINTIC
  - TAPEWORM, PAROMOMYCIN (2252)
- ANTIBIOTIC
  - ANTHIOMALINE, ASTIBAN, NIRIDAZOLE, SCHISTOSOMIASIS, CAMEROON (2253)
  - BACTERIAL INFECTION, IRAN, CHILDREN (2228)
  - DIARRHEA (2203)
  - DOXYCYCLINE, AMEBIASIS, INTESTINE (2263)
  - ENTERIC FEVER (2226)
  - RIFAMPICIN, FECES, FLORA, BILIARY EXCRETION, RAT (2215)
  - THERAPY, CAUSTIC BURNS, ESOPHAGUS (1826)*
  - TREATMENT, BACTERIA, BILIARY TRACT, DIAGNOSIS (2176)
  - UREACYCLE ENZYMES, RAT, LIVER (1760)
- ANTIBODY
  - BILE CANALICULI, CHRONIC HEPATITIS (2125)*
  - HUMORAL, ISOANTIGEN, IMMUNOFLUORESCENCE, HEPATOMA CELLS (1581)*
  - LIVER, HEPATOMA, LIVER ALDOLASE, MUSCLE ALDOLASE (1703)*

  - PARIETAL CELL, RHEUMATOID ARTHRITIS, VITAMIN B12, ABSORPTION (1625)*
  - TREATMENT, AMEBIASIS (2261)
- ANTICARCINOGEN
  - VINCRISTINE, HEPATOBLASTOMA, INFANT (2047)
- ANTICHOLINERGIC
  - METOCHLOPRAMIDE, STOMACH, DUODENUM (1661)
  - STOMACH, DUODENUM, ULCER (1828)
- ANTICYTOLYTIC
  - LIVER, HEPATOCYTE (1729)
- ANTIEMETIC
  - CHOLINERGIC, METOCHLOPRAMIDE, GASTROINTESTINAL TRACT (1660)
- ANTIGEN
  - AUSTRALIA, VIRAL HEPATITIS (2114)
  - LIVER, CHRONIC HEPATITIS, ACUTE HEPATITIS (2133)*
  - ISO, IMMUNOFLUORESCENCE REACTION, HUMORAL ANTIBODY, HEPATOMA CELLS (1581)*
- ANTILYMPHOCYTE SERUM
  - JEJUNUM, SMALL INTESTINE (1931)
- ANTIOXIDANT
  - BUTYLATED HYDROXY TOLUENE, MICROSOME ENZYME, STIMULATION (1614)
- ANTISPASMODIC
  - PHLORO-GLUCINOL-TRIMETHYLESTER, BILIARY AND INTESTINAL DISEASES (1656)
- ANTITUBERCULOUS DRUG
  - ETHIONAMID, ISONIAZID, AMINOSALICYLIC ACID, ABSORPTION, GI TRACT (1899)
- ANTRAL POUCH
  - MOTILITY, STOMACH, DENERVATED (1645)*
- ANUS
  - ANAL SPHINCTER, POST-HEMORRHOIDECTOMY PAIN (1988)
  - CANCER, RADIOTHERAPY (2005)
  - CARCINOMA, TNM CLASSIFICATION (2011)
  - MELANOMA, SURGERY (1994)
  - SCHISTOSOMA, INFECTION, PEDIATRICS (2254)
- APPENDICITIS
  - ACUTE, DEATH, CHILDREN (2010)
  - ACUTE, GERIATRICS, SURGERY (1996)
    LON, DIAGNOSIS (1977)
- APPENDIX
  - VERMIFORM, ADENOMA, PAPILLARY, VILLOUS (1979)
- ARTERIOGRAPHY
  - COLON, VIABILITY, ABDOMINAL PERFORATION (1976)
  - LIVER, SCINTILLOGRAPHY, SPACE OCCUPYING LESIONS (1801)*
- ARTERY
  - ABDOMINAL AORTA, ILIAC, SURGERY, AORTO-INTESTINAL FISTULAS (1938)
  - HEPATIC, LIGATION, LIVER REGENERATION, RESECTION, RAT (1746)
  - SUPERIOR MESENTERIC, UPPER GASTROINTESTINAL OBSTRUCTION, SEVERE BURNS (2211)
- ASTHMA
  - INTESTINE, PARASITE (2257)
- ATRESIA
  - CONGENITAL, INTRAHEPATIC BILE DUCTS, OBSTRUCTION (2062)
  - CONGENITAL, BILIARY DUCT, INTESTINAL EXCRETION OF BILE PIGMENTS, CHILDREN (2171)
  - ESOPHAGUS, DIAGNOSIS (1829)
- AUTONOMIC GANGLIA
  - BLOCKING AGENTS, STIMULANTS, SECRETORY RESPONSE, HEIDENHAIN POUCH, DOG (1677)
- AUTORADIOGRAPHY
  - CARBONTETRACHLORIDE POISONING, LIVER, MUCOPOLYSACCHARIDE (1714)*
- BACILLUS
  - DYSENTERY, SHIGELLA (2225)
- BACTERIA
  - AEROMONAS, HYDROPHILIA, ACUTE ENTERITIS (2268)
  - BILIARY TRACT, DIAGNOSIS, TREATMENT (2176)
  - DIARRHEA, SUDAN, CHILDREN
  - DYSENTERY EPIDEMIC, JAPANESE, SANITATION (2247)
  - E.COLI, INTESTINE, BIOCHEMISTRY, PATHOLOGY (2264)
  - ILEUM, JEJUNUM, COLON, SURGERY (1927)
  - INFECTION, IRAN, CHILDREN, ANTIBIOTIC (2228)
  - SALMONELLAE, SHIGALLAE, DETECTION, HEALTHY CARRIERS (1798)
  - SALMONELLOSIS, INCIDENCE, ANTIBIOTICS (2008)
  - SCHISTOSOMA INTERCALATUM, TREATMENT, CAMEROON (2253)
- BACTERIAL ENDOTOXEMIA
  - RUNTING SYNDROME, GRAFT VS. HOST REACTION, LIVER, ELECTRON MICROSCOPY, MICE (1564)*
- BACTERIOLOGY
  - DIARRHEA, E.COLI, KLEBSIELLA (2227)
- BENTONITE FLOCCULATION TEST
  - AMEBIASIS, SEROLOGIC DIAGNOSIS (2267)
- BENZICDARONE
  - METABOLISM, BILIARY EXCRETION, SULFOBROMOPHTHALEIN (1765)
- BETA RECEPTOR
  - DRUG INTERACTIONS, ATRIUM, AORTA, STOMACH, TRACHEA, RABBIT (1796)
- BILE
  - BILIRUBIN, BILIVERDIN, PHOTODECOMPOSITION (1724)*
  - CANALICULI, ACTIVE HETERO-ANTIBODY, CHRONIC HEPATITIS (2125)*
  - CHOLEPHILIC DYES, CLINICAL CHEMISTRY (1747)
  - EXCRETION, BROMOSULFALEIN, SHEEP (1771)
  - LIVER, LAENNEC'S, CIRRHOSIS (2130)*
  - PERITONITIS (2081)
  - STOMACH, IMPLICATION (1879)
  - VITAMIN D METABOLITES, SEPARATION, IDENTIFICATION, RAT (1720)*

ILE ACID
  - METABOLISM, SMALL INTESTINE SURGERY, SMALL INTESTINE MICROORGANISMS (2191)*
  - CHOLESTYRAMINE, CHOLELITHIASIS, HAMSTER, MAN (1770)

ILE DUCT
  - CARCINOMA, ANGIOGRAPHY, THORIUM DIOXIDE (2181)
  - CHOLANGIOGRAPHY, SURGERY, SPHINCTER OF ODDI (2168)
  - COMMON, DIAPHRAGM, CONGENITAL, SURGERY (2182)
  - FIBRO-ANGIO-ADENOMATOSIS, FAMILIAL, CHRONIC ICTERUS (2183)
  - HEPATIC, OCCLUSION, OBSTRUCTIVE JAUNDICE, OLD AGE (2172)
  - INTRAHEPATIC, CONGENITAL ATRESIA, OBSTRUCTION (2062)
  - SURGERY, PAPILLOTOMY, TRANSDUODENAL SPHINCTEROTOMY (1956)

ILE PIGMENT
  - BILIRUBIN, BILIRUBIN-GLUCRONIDE (2184)

ILE SALT
  - CHOLESTEROL, METABOLISM, LECITHIN (1698)*
  - SODIUM TAURODEOXYCHOLATE, JEJUNUM, PERMEABILITY CHANGES, RAT (1634)*

ILHARZIASIS
  - BILE PIGMENT, SCHISTOSOMIASIS (2244)
  - PARASITE, SCHISTOMIASIS TARTAR EMETIC THERAPY (2255)

ILIARY TRACT
  - AMPULLA OF VATER, CARCINOMA (2178)
  - BACTERIA, DIAGNOSIS, TREATMENT (2176)
  - BILE DUCT, CARCINOMA, ANGIOGRAPHY, THORIUM DIOXIDE (2181)
  - RADIOLOGY, DIAGNOSIS, PATHOLOGY (1806)*
  - CHOLANGIOGRAPHY, CHOLECYSTOGRAPHY, INFUSION (1824)
  - CHOLELITHIASIS, INCIDENCE, SURGERY, FACILITIES (2165)
  - CONGENITAL BILIARY DUCT ATRESIA, INTESTINAL EXCRETION OF BILE, PIGMENTS, CHILDREN (2171)
  - CYSTS, DIAGNOSIS, SURGICAL TREATMENT (2177)
  - DIAGNOSIS OF DAMAGE, PERCUTANEOUS TRANSHEPATIC CHOLIANGIOGRAPHY (1816)
  - DISEASES, TREATMENT, PHLORO-GLUCINOL-TRIMETHYLESTER (1656)
  - EXTRAHEPATIC OBSTRUCTION, THORACIC DUCT LYMPH COMPOSTION, ENZYMES, PROTEINS, ELECTROLYTES (2164)*
  - GALLBLADDER, CALCULOSIS, ENZYME, LIVER DAMAGE (2163)*
  - GALLBLADDER, CHOLANGIOGRAPHY, TRANSHEPATIC (2180)
  - GALLBLADDER, CHOLECYSTOGRAPHY (1822)
  - GALLBLADDER, CHOLELITHIASIS, MUCUS MEMBRANE CHANGES (2175)
  - GALLBLADDER, FUNCTION, VAGOTOMY (2166)
  - GALLBLADDER, PYELOGRAPHY (1820)
  - GALLBLADDER, RADIOLOGY, CHOLANGIOGRAPHY (1819)
  - LIVER, ISONIAZIDE (1944)
  - MODIFICATION, RE-OPERATION, GASTRECTOMY, NUTRITIONAL SYNDROME (1867)
  - PHYSIOLOGY, DISEASE, RECENT ADVANCES (2245)
  - ROENTGENOLOGICAL DIAGNOSIS (1813)

BILIRUBIN
  - EARLY FEEDING, FLUIDS, WEIGHT, PREMATURE INFANTS (1762)
  - GLUCURONIC ACID, LIVER DAMAGE, BILE DAMAGE (1744)
  - GLUCURONIDE, BILE (2184)
  - LIVER, IRON, JAUNDICE (2131)*
  - LIVER, SECRETION, PIGMENT (1734)
  - LYMPH COMPOSITION, THORACIC DUCT, BILIARY OBSTRUCTION, LYMPH-TO-BLOOD RATIO (2164)*
  - SERUM, JAUNDICE, AFRICA (2167)

BIOPSY
  - DIRECT VISION, GASTROSCOPY, ENDOSCOPY (1823)

BLOOD FLOW
  - LIVER, GLUCAGON, DOG (1790)*

BURNS
  - CAUSTIC, ESOPHAGUS, ANTIBIOTIC, STEROID, THERAPY (1826)*

CALCIUM
  - ABSORPTION, SMALL INTESTINE, MAGNESIUM, JEJUNUM (1631)*
  - LARGE INTESTINE, COLON, CARCINOMA (1969)*

CANCER
  - ADENOCARCINOMA, COLON, RECTUM (1989)
  - CARCINOID SYNDROME, SMALL INTESTINE (1936)
  - CARCINOID SYNDROME, TUMOR OF MECKEL'S DIVERTICULUM, ILEAL TUMOR (1934)
  - CARCINOMA, AMPULLA OF VATER (2178)
  - ANAL CARCINOMA, TNM CLASSIFICATION (2011)
  - CARCINOMA, ANGIOGRAPHY, THORIUM DIOXIDE, BILE DUCT (2181)
  - CARCINOMA, GALLBLADDER, DIAGNOSIS, SURGERY (2185)
  - CARCINOMA, GASTROINTESTINAL TRACT, METHOTREXATE, THERAPY (2246)
  - CARCINOMA, HOSPITAL INCIDENCE (2241)
  - CARCINOMA, PANCREAS, CHRONIC PANCREATITIS (2031)
  - CARCINOMA, PITUITARY GLAND, METASTASIS TO LIVER AND BONES (2051)
  - CARCINOMA, RECTO-SIGMOID, SURGICAL TECHNIQUE (1975)
  - CARCINOMA, STOMACH, HISTOGENESIS, DEVELOPMENT (1880)
  - CARCINOMA, THORACIC ESOPHAGUS, LAPAROTOMY (1852)
  - COLON, RECTUM, INCIDENCE (1986)
  - DIGESTIVE CARCINOMA, METASTASES, PARTIAL HEPATECTOMY (2076)
  - ESOPHAGUS, CICATRIX (1830)
  - ESOPHAGUS, CLINICAL COURSE, DIAGNOSIS, TREATMENT (1843)
  - ESOPHAGUS, FISTULA (1837)

  - ESOPHAGUS, SURGICAL TECHNIQUES (1840)
  - GASTROINTESTINAL TRACT, CHEMOTHERAPY (2216)
  - HEPATOBLASTOMA, ANTICARCINOGEN THERAPY, INFANT (2047)
  - LEIOMYSARCOMA, ILEUM, TESTIS (1946)
  - LIP, STOMACH DISORDERS (1885)
  - LIVER, CIRRHOSIS, SCANNING (1803)*
  - LIVER, FETOPROTEIN, SERUM (2073)
  - LIVER, METASTASES, SERUM ENZYMES (2035)*
  - MALIGNANT, SECONDARY HEPATIC DEPOSITS EXCISION (2050)
  - PANCREAS, DIABETES (2024)
  - PANCREAS, DIAGNOSIS, RETROPERITONEAL GAS STUDY (2023)
  - POLYPOID CARCINOMA, DUODENUM, DIAGNOSIS, TREATMENT (1891)
  - PRIMARY, DUODENUM, DIAGNOSIS, TREATMENT (1890)
  - PRIMARY MALIGNANT TUMOR, JEJUNUM (1945)
  - RETICULUM SARCOMA, STOMACH (1894)
  - SARCOMA, IMPLANTATION, ANASTOMOSIS, COLON, RAT (1978)
  - SMALL INTESTINE, REGIONAL ENTERITIS (1960)
  - STOMACH
    (1896), (1897)
  - STOMACH, ENZYME, INHIBITION, ACTIVATION (1868)
  - STOMACH, METASTASIS (1861)
  - VILLOUS TUMOR, EXUDATIVE GASTROPATHY HYPOPROTEINEMIA, GASTRECTOMY (1887)
- CAPSAICIN
  - ILEUM, ISOLATED, AURICLE, GUINEA PIG (1652)
- CARBOHYDRATE
  - DIGESTION, ABSORPTION (1638)
  - METABOLISM, MALNUTRITION, JAMAICA, CHILDREN (2213)
- CARBON TETRACHLORIDE
  - POISONING, HEPATIC COLLAGENOLYTIC ACTIVITY, RATS (1750)
  - POISONING, LIVER, MUCOPOLYSACCHARIDE SYNTHESIS, AUTORADIOGRAPHIC STUDIES (1714)*
  - POISONING, LIVER, MUCOPOLYSACCHARIDE SYNTHESIS, PASSIVE BINDING (1715)*
- CARCINOGEN
  - 2-FLUORENYLACETAMIDE, AFLATOXIN B1, HYPERPLASTIC LIVER NODULES, IN VITRO GROWTH, RAT (1754)
- CARCINOGENESIS
  - LIVER, CELL SPECIFIC GRAVITY (2093)
- CARCINOMA
  - ANUS, TNM CLASSIFICATION (2011)
  - BILE DUCT, ANGIOGRAPHY, THORIUM DIOXIDE (2181)
  - CELL BIOCHEMISTRY, HYDROGEN ION TRANSPORT, OXIDATIVE PHOSPHORYLATION (1774)
  - CERVICAL ESOPHAGUS, TRANSPOSED STOMACH REPLACEMENT (1849)
  - COLON, SURGERY, GERIATRICS (1931)
  - DUODENUM, POLYPOID, DIAGNOSIS TREATMENT (1891)
  - ESOPHAGUS, RADIOTHERAPY, SPLIT-COURSE (1825)*
  - GALLBLADDER, DIAGNOSIS, SURGERY (2185)
  - GASTROINTESTINAL TRACT, HOSPITAL INCIDENCE (2241)
  - HEPATIC METASTASES, PARTIAL HEAPTECTOMY, (2076)
  - LIVER (2058)
  - LIVER, MOTOL VIRUS, LIVER PATHOLOGY, DIETHYLINTROSAMINE (2036)*
  - LIVER SCANS, DIAGNOSIS (2034)*
  - METASTATIC, LIVER (2041)
  - PANCREAS, DIAGNOSIS, RETROPERITONEAL GAS STUDY (2023)
  - PITUITARY GLAND, METASASIS TO LIVER AND BONES (2051)
  - PRIMARY, DUODENUM (1898)
  - PRIMARY, DUODENUM, DIAGNOSIS, TREATMENT (1890)
  - RECTOSIGMOID, IRRADIATION (1997)
  - RECTOSIGMOID, SURGICAL TECHNIQUE (1975)
  - SMALL INTESTINE, REGIONAL ENTERITIS (1960)
  - STOMACH, HISTOGENESIS, DEVELOPMENT (1880)
  - THORACIC ESOPHAGUS, LAPAROTOMY (1852)
  - TRANSVERSE COLON, DESCENDING COLON (1968)*
- CECUM
  - COLON, PARASITE, GRANULOMA, SHISTOSOMIASIS (2250)*
  - PERFORATION, INFANT (1990)
- CELIAC DISEASE
  - HYPOSPLENISM (1966)
  - PRECIPITIN DETECTION, AQUEOUS EXTRACTS OF FLOUR, CHILDREN (1965)
  - MALABSORPTION, GLUTEN SENSITIVITY, SMALL INTESTINE (1961)*
- CELL
  - LIVER, CARCINOMA, SPECIFIC GRAVITY (2093)
- CERULOPLASMIN
  - LIVER, SECRETION, COPPER (1702)*
- CHEMICAL CARCINOGEN
  - LIVER, RIBONUCLEIC ACID, RADIOACTIVE COMPOUNDS (1776)
- CHOLANGIOGRAPHY
  - BILIARY TRACT, RADIOLOGY, DIAGNOSIS, PATHOLOGY, DIAGNOSTIC TECHNIQUES (1805)*
  - GALLBLADDER, BILIARY TRACT (1819)
  - INFUSION (1824)
  - SURGERY, BILE DUCT, CHOLEDOCHOTOMY (2168)
  - TRANSHEPATIC (2180)
- CHOLANGITIS
  - HEPATITIS, BIOPSY, INFANCY, CHOLESTASIS (2084)*
  - OBLITERATING, SCLEROSING, LIVER (2048)
- CHOLECYSTITIS
  - ACALCULOSIS, GALLBLADDER, SURGERY (2169)

  - ACUTE, TREATMENT, GALLSTONE (2170)
  - GASTRITIS, HEPATITIS, RADIOLOGY (2206)
- CHOLECYSTOGRAPHY
  - GALLBLADDER (1822)
  - INFUSION (1824)
- CHOLECYSTOKININ
  - VAGOTOMY, PRESSURES, GALLBLADDER, DUODENUM, CAT (1649)*
- CHOLEDOCHOTOMY
  - SPHINCTER OF ODDI, CHOLANGIOGRAPHY (2168)
- CHOLELITHIASIS
  - BILE ACID, CHOLESTYRAMINE, HAMSTER, MAN (1770)
  - DIET, FORMATION, THERAPY (1690)
  - GALLBLADDER, MUCUS MEMBRANE CHANGES (2175)
  - INCIDENCE, SURGERY, FACILITIES (2165)
- CHOLERA
  - ASIATIC, INTESTINAL MICROFLORA, CHILDREN (2001)
  - FECES, MICROFLORA, LARGE INTESTINE (2192)*
  - SMALL INTESTINE, MICROFLORA, VIBRIOS (2193)*
  - LIVER, CIRRHOSIS, ALCOHOL (2139)
- CHOLESTASIS
  - INTRAHEPATIC, 6-MERCAPTOPURINE (2186)
- CHOLESTEROL
  - LYMPH COMPOSITION, THORACIC DUCT, BILIARY OBSTRUCTION, LYMPH-TO BLOOD RATIO (2164)*
  - METABOLISM, LECITHIN, BILE SALT (1698)*
- CHOLIANGIOGRAPHY
  - PERCUTANEOUS, TRANSHEPATIC, BILIARY TRACT DAMAGE (1816)
- CHOLINERGIC
  - METOCHLOPRAMIDE, ANTI-EMETIC, GASTROINTESTINAL TRACT (1660)
- CHROMATOGRAPHY
  - CARBON TETRACHLORIDE POISONING, LIVER MUCOPOLYSACCHARIDE SYNTHESIS, PASSIVE BINDING (1715)*
- CICATRIX
  - ESOPHAGUS, CANCER (1830)
- CIRCULATION
  - ARTERIAL, DESATURATION, CIRRHOSIS (2146)
  - ENTEROHEPATIC, RADIOACTIVE DETERMINATION, URINARY ESTROGEN (1700)*
  - ENTEROHEPATIC, SALMONELLOSIS, TYPHOID FEVER, ANTIBIOTIC (1972)*
  - ENTEROHEPATIC, UREA NITROGEN, BACTERIAL FLORA (1691)*
  - ENTEROHEPATIC, URINARY ESTROGEN, RADIOACTIVE DETERMINATIONS (1700)*
  - LIVER, ENZYME, LOBE LIGATION, RAT (1598)
  - LIVER, EXTRACORPOREAL CIRCULATION, LIVER PHOSPHORYLASE (1709)*
  - LIVER, FUNCTION, GLYCOGEN, LOBE LIGATION, RAT (1600)
  - LIVER, LIPID, LOBE LIGATION, RAT (1597)
  - LIVER, PHOSPHORYLASE, LOBE LIGATION, RAT (1599)
  - VENOUS, LIVER, SURGERY (1792)
- CIRRHOSIS
  - ALCOHOL, CHOLERETIC, LIVER (2139)
  - ANATOMY, DIAGNOSIS (2140)
  - ANGIOTENSINASE, ENZYME ACTIVITY ANGIOTENSIN (1706)*
  - ANTIGEN, LIVER, HEPATITIS (2133)*
  - ARTERIAL DESATURATION (2146)
  - ASCITIC, ELECTROCARDIOGRAPHY (2161)
  - BILIARY, LAENNEC'S, BILE (2130)*
  - CHRONIC, PROTEIN-FREE LIVER EXTRACT, TREATMENT (2126)
  - CORTICOSTEROIDS, METABOLISM (2148)
  - DIAPHRAGM, ASCITES, RUPTURE, DIAGNOSIS (2189)*
  - ELECTROLYTE, ALTERATION (2147)
  - ESOPHAGEAL VARICES, SELECTIVE DECOMPRESSION, LEFT GASTRIC VENOUS-CAVAL SHUNT (2132)*
  - ESTROGEN METABOLISM, CHROMATOGRAPHY, MAN (2160)
  - FATTY LIVER, PLASMA PHOSPHOLIPIDS (2129)*
  - FUNCTIONAL, RENAL FAILURE (2150)
  - GENERAL OBSERVATIONS (2058)
  - HEPATITIS, AUTOALLERGIC PHENOMENON (2091)
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  - STOMACH, DUODENUM, PH ANTRO-FUNDAL REGION (1723)*
- HISTOCHEMISTRY
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  - LIVER, ULTRASTRUCTURE, BIOCHEMISTRY, HEMORRHAGIC SHOCK (1575)*
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  - ISLET CELL, ADENOMA, DIAGNOSIS, SURGERY (2019)
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  - SECRETION, STOMACH, NERVOUS CONTROL (1675)*
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  - GASTRIC SECRETION, ACID, INTRINSIC FACTOR (1668)*
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  - CELLULAR CALCIUM TRANSPORT SYSTEM, SMOOTH MUSCLE (1646)*
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  - DISACCHARIDASES, MUCOSA (1942)
  - GALLSTONE, SURGERY (1940)
  - GALLSTONE, SURGERY, ENTEROTOMY (1941)
  - HISTOLOGY, TRACER TECHNIQUE, VILLI, MORPHOLOGY (1571)*
  - ISOLATED, AURICLE, CAPSAICIN, GUINEA PIG (1652)
  - JEJUNUM, COLON, SURGERY (1951)
  - JEJUNUM, COLON, SURGERY (1929)
  - JEJUNUM, VILLUS, SMALL INTESTINE, DUODENUM (1569)*
  - LEIOMYSARCOMA (1946)
  - LYSOSOMES, ALKALINE PHOSPHATASE, NEONATE, RAT (1593)
  - MELANOSIS, ELECTRON MICROSCOPY (1933)
  - MUCOSA, JEJUNUM, ALDOSTERONE TRANSFER SYSTEM (1630)*
  - RUPTURE, PERITONITIS, INGUINAL HERNIA, BLUNT TRAUMA (1957)
  - THIRY-VELLA LOOP, SODIUM DEPLETION, INTESTINAL TRANSPORT (1629)*
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  - METABOLISM, PROTEIN, AMINO ACID, HEPATOMA (1711)*
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  - GRAFT VS. HOST REACTION, RUNTING SYNDROME, BACTERIAL ENDOTOXEMIA, LIVER, ELECTRON MICROSCOPY, MICE (1564)*
  - SALMONELLA, POLYSACCHARIDES (1632)
  - ZOLLINGER-ELLISON SYNDROME, GASTRIN, TRACER TECHNIQUE (1808)*
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  - HYPOGLYCEMIA, GASTRECTOMY (1876)
  - LIVER, POTASSIUM, SH-COMPOUNDS (1743)
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  - AMEBIASIS, ANTIBIOTIC TREATMENT (2263)
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  - DISEASES, TREATMENT, PHLORO-GLUCINOL TRIMETHYLESTER (1656)
  - ESCHERICHIA COLI, BIOCHEMISTRY, PATHOLOGY (2264)
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ANUS, CANCER, RADIOTHERAPY (2005)
ANUS, CARCINOMA, TNM CLASSIFICATION (2011)
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COLON, ISCHEMIC COLITIS, GANGRENE (2006)
COLON, LYMPHOID HYPERPLASIA, CHILDREN (1992)
COLON, LYMPHOID HYPERPLASIA, CHILDREN (1993)
COLON, PERFORATION, INFANT (1984)
COLON, RECTOSIGMOID JUNCTION, PERFORATION, FOREIGN BODY (1985)
COLON, RECTUM, ADENOCARCINOMA (1989)
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COLON, RETROGRADE, INTUBATION (1818)
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COLON, TRANSMURAL ELECTRICAL PORENTIAL DIFFERENCE, ILEUM, RECORDING ELECTRODES (1647)*
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COLON, ULTRASTRUCTURE, HISTOCHEMISTRY, LIPIDS (1582)*
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COLON, VOLVULUS, ETIOLOGY, TREATMENT (1987)
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RECTOSIGMOID CARCINOMA, SURGERY (1975)
RECTUM, ANUS, APPENDIX, CROHN'S DISEASE (2000)
RECTUM, BLADDER, RADIATION ABSORPTION DOSE RATE MEASUREMENT (1998)
RECTUM, COLON, PSEUDOMEMBRANOUS COLITIS, ANTIBIOTIC (1991)
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DIVERTICULITIS, DIVERTICULOSIS, CLINICAL FEATURES (2002)
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DUODENUM, VAGOTOMY, DISTAL ANTRECTOMY (1900)*
DUODENUM, DRAINAGE, SPHINCTEROTOMY (1869)
DUODENUM, PEPTIC ULCER, SURGERY (1924)
DUODENUM, PEPTIC ULCER, VAGOTOMY (1921)
DUODENUM, POLYPOID CARCINOMA, DIAGNOSIS, TREATMENT (1891)
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DUODENUM, PRIMARY CARCINOMA, DIAGNOSIS, TREATMENT (1890)
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DUODENUM, STOMACH, ANTICHOLINERGIC (1661)
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DUODENUM, STOMACH, STRESS ULCER, TREATMENT (1911)
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DUODENUM, ULCER, SURGERY (1920)
DUODENUM, ULCER, GASTRIC MUCUS, VOSCOSITY (1916)
ENTERITIS, RADIOLOGY (1959)
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  - ENZYME, ANTIGEN, ELECTRON MICROSCOPY (1785)*
  - ENZYME, LACTASE, INTESTINAL DISACCHARIDES (1782)*
  - ENZYME, RETINOIC ACID, INTESTINAL MUCOSA (1783)*
  - FISTULA, URETERO-DUODENAL (1881)
  - GALLBLADDER, PRESSURES, VAGOTOMY, CHOLCYSTOKININ STIMULATION (1649)*
  - GASTROENTERITIS, STOMACH, BIOCHEMISTRY, (2223)
  - GLUCOSE UTILIZATION, OXYGEN ABSORPTION, JEJUNUM (1587)
  - HISTOLOGY, DIARRHEA, CELIAC DISEASE, MALABSORPTION, TROPICAL SPRUE (2194)*
  - HISTOLOGY, TRACER TECHNIQUE, VILLI, MORPHOLOGY (1571)*
  - ILEUM, ALKALINE PHOSPHATASE, LYSOSOME NEONATE (1593)
  - ILEUM, ISOLATED, AURICLE, CAPSAICIN (1657)
  - ILEUM, COLON, TRANSMURAL ELECTRICAL POTENTIAL DIFFERENCE, RECORDING ELECTRODES (1647)*
  - ILEUM, JEJUNUM, DISACCHARIDASES, MUCOSA (1942)
  - ILEUM, MELANOSIS, ELECTRON MICROSCOPY (1933)
  - ILEUM, THIRY-VELLA LOOP, SODIUM DEPLETION, ELECTROLYTE, INTESTINAL TRANSPORT (1629)*
  - ILEUM, CALCIUM TRANSPORT (1646)*
  - INFARCTION, PORTAL VEIN, RADIOLOGY (2219)
  - JEJUNUM, ANTILYMPHOCYTE SERUM (1931)
  - JEJUNUM, ENZYME, VILLI, CELLULAR DIFFERENTIATION (1784)*
  - JEJUNUM, ILEUM, ALDOSTERONE, MUCOSAL TRANSFER SYSTEM, SODIUM, POTASSIUM WATER (1630)*
  - JEJUNUM, LEIOMYOMA (1944)
  - JEJUNUM, TUMOR, PRIMARY, MALIGNANT (1945)
  - JEJUNUM, SODIUM, ENZYME (1633)*
  - LEIOMYSARCOMA (1946)
  - LIVER, PLACENTA, ENZYME, FETUS, MAN (1730)
  - LYMPHOMA, SURGERY, RADIATION (1932)
  - MAGNESIUM, ABSORPTION, CALCIUM (1631)*
  - MALABSORPTION, CELIAC DISEASE, GLUTEN SENSITIVITY (1961)*
  - MALABSORPTION, IMMUNOGLOGULINS, NON-TROPICAL SPRUE (1962)*
  - MECKEL'S DIVERTICULUM, ILEUM, TUMOR, CARCINOID SYNDROME (1934)
  - MECONIUM ILEUS, TREATMENT, CONTRAST ENEMAS (1926)*
  - MICROORGANISM, SURGERY, BIOCHEMISTRY (2191)*
  - MUCOSA, TUMOR (1939)
  - MUCOSA, ULTRASTRUCTURE, HISTOLOGY, HISTOCHEMISTRY (1563)*
  - OBSTRUCTION, ACUTE, HISTOPLASMOSIS (1952)
  - PANETH CELL, MITOSIS, CELLULAR REGENERATION (1567)*
  - PEPTIC ULCER, DRUG THERAPY (1922)
  - PEPTIDE ABSORPTION, COMPETITIVE INHIBITION, MUCOSAL CELLS (1626)*
  - PERMEABILITY CHANGES, BILE SALT, RAT (1634)*
  - PRIMARY ULCER (2114)
  - RADIOLOGY, OBSTRUCTION, SURGERY (1812)
  - RECEPTORS, CHOLINERGIC, SMOOTH MUSCLE IONIC FLUX (1788)
  - REFLEX, JEJUNUM, DUODENUM (1655)
  - REFLUX, COLON AGANGLIONOSIS, NEONATES (1970)*
  - RESECTION, FUNCTIONAL COMPENSATION, RAT (1789)
  - RESECTION, ASSESSMENT DIET, HIGH PROTEIN DIET (1925)*
  - RUPTURED ILEUM, PERITONITIS, INGUINAL HERNIA, BLUNT TRAUMA (1957)
  - SCANNING ELECTRON MICROSCOPY, VILLI, GOBLET CELLS, EPITHELIAL CELLS, MICROVILLI (1568)*
  - SCLERODERMA, PNEUMATOSIS CYSTOIDES, INTESTINALIS (1949)
  - STENOSIS, CONGENITAL (1954)
  - SYMPATHOMIMETICS, METABOLISM (1651)
  - TRANSDUODENAL SPHINCTEROTOMY, PAPILLOTOMY, BILIARY AND PANCREATIC DUCT SURGERY (1956)
  - ULCER, POTASSIUM CHLORIDE INGESTION, ENTERIC COATING (1930)
  - ULTRASTRUCTURE, HORMONAL EFFECTS, GASTRIN (1671)*
  - ULTRASTRUCTURE, EPITHELIUM, GOBLET CELLS (1566)*
  - VILLI, MORPHOLOGY, HISTOLOGY (1570)*
  - VILLUS SIZE, DUODENUM, JEJUNUM, ILEUM COLON, ILEAL CHYME, VILLUS-ENLARGING FACTOR (1569)*
- INTRINSIC FACTOR
  - SECRETION, GASTRIC ACID, HYPOTHYROIDISM, HYPERTHYROIDISM (1668)*
- INTUBATION
  - STOMACH, ESOPHAGUS, BOWEL OBSTRUCTION (1804)*
- INTUSSUSCEPTION
  - TREATMENT, INFANTS, CHILDREN (1937)
- ION
  - FLUX, SMALL INTESTINE, CHOLINERGIC RECEPTORS, SMALL INTESTINE (1788)
  - TRANSPORT, STOMACH, MUCOSA, SECRETION (1674)*
  - TRANSPORT, STOMACH, HYDROGEN ION, ANAEROBIC MECHANISMS (1643)
- IRON
  - ABSORPTION, GASTROINTESTINAL TRACT, SEX FACTORS, IRON BINDING CAPACITY (1635)
  - EXCRETION, MUCOSAL EQUILIBRIUM, STOMACH (1640)
  - METABOLISM, LIVER, PORPHYRIA, CUTANEA TARDA (2071)
  - SERUM, BILIRUBIN, JAUNDICE (2131)*

- ISATIN
  - ENZYME INHIBITION, LIVER, RAT (1732)
- ISLET CELL
  - ADENOMA, HYPERINSULINISM, DIAGNOSIS, SURGERY (2019)
  - PANCREAS, ULTRASTRUCTURE, ALLOXAN TOXICITY (1604)
- ISLET OF LANGERHANS
  - PANCREAS, INSULIN, HISTOLOGY (1685)*
- ISONIAZID
  - LIVER, BILIARY TRACT (1733)
  - TUBERCULOSIS, DEATH (2098)
- JAUNDICE
  - CONGENITAL, NONOBSTRUCTIVE NONHEMOLYTIC, PHOTOTHERAPY, INFANT (2037)*
  - CONGENITAL, NONOBSTRUCTIVE, NONHEMOLYTIC, PHOTOTHERAPY, INFANT (2038)*
  - EXTRAHEPATIC BILIARY OBSTRUCTION, THORACIC DUCT LYMPH COMPOSITION, ENZYMES, ELECTROLYTES, PROTEINS (2164)*
  - HEPATIC, HEMOLYTIC, OBSTRUCTIVE, AFRICA (2167)
  - HEMOLYSIS (2120)
  - ISONIAZID, TUBERCULOSIS, FATAL (2098)
  - LIVER, CHOLANGITIS (2048)
  - NON-HEMOLYTIC, GILBERT'S SYNDROME, PIGMENT OVERLOAD, BSF RETENTION (2053)
  - OBSTRUCTIVE, ALKALINE PHOSPHATASE, ENZYMES (1700)*
  - OBSTRUCTIVE, HEPATIC BILE DUCT, OCCLUSION, OLD AGE (2172)
  - OPEN HEART SURGERY, CARDIOPULMONARY BYPASS (2072)
- JEJUNUM
  - ABSORPTION, MAGNESIUM, CALCIUM, ELECTROLYTES (1631)*
  - AMINO ACID, ACTIVE TRANSFER (1787)*
  - ANTILYMPHOCYTE SERUM (1931)
  - DNA, FORMATION, LOSS, EPITHELIUM, MICE (1781)
  - DISACCHARIDASES, MUCOSA (1942)
  - ENZYME ACTIVITY, LOW TEMPERATURE, STORAGE TIME, RAT (1606)
  - HISTOLOGY, MORPHOLOGY, VILLI (1570)*
  - ILEUM, COLON, BACTERIA, SURGERY (1927)
  - ILEUM, COLON, SURGERY (1951)
  - ILEUM, COLON, SURGERY (1929)
  - ILEUM, MUCOSAL, TRANSFER SYSTEM, ALDOSTERONE (1630)*
  - LEIOMYOMA (1944)
  - MALABSORPTION, IMMUNGLOBULINS, NON-TROPICAL SPRUE (1962)*
  - MUCOSA, BACTERIAL FLORA, DUODENUM (2190)*
  - OXYGEN UPTAKE, GLUCOSE UTILIZATION, SMALL INTESTINE (1587)
  - PANETH CELL, MITOSIS, CELLULAR REGENERATION (1567)*
  - PERMEABILITY CHANGES, BILE SALT, RAT (1634)*
  - PRIMARY MALIGNANT TUMOR (1945)
  - REFLEX, DUODENUM, SMALL INTESTINE (1655)
  - SCANNING ELECTRON MICROSCOPY, VILLI, GOBLET CELLS, MICROVILLI, EPITHELIAL CELLS (1568)*
  - VILLI, CELLULAR DIFFERENTIATION (1784)*
  - VILLUS, DUODENUM, ILEUM (1569)*
  - WATER TRANSPORT, SODIUM, CIRCULATION ENZYME (1633)*
- KIDNEY
  - ENZYME ACTIVITY, LOW TEMPERATURE, STORAGE TIME, RAT (1606)
  - FUNCTIONAL FAILURE, CIRRHOSIS (2150)
  - LIVER, DISEASE, FIBRIN-STABILIZATION FACTOR, METHODOLOGY (2054)
  - PYELONEPHRITIS, PYONEPHROSIS, PERITONITIS (2249)
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  - VASODILATOR, HYPOTENSION (2145)
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  - ACUTE HEMORRHAGIC PANCREATITIS, PLASMA, FORMATION AND DESTRUCTION, DOG (2026)*
- KWASHIORKOR
  - PROTEIN DEFICIENCY, MALNUTRITION, HYPOGLYCEMIA (2197)
- LACTASE
  - PURIFICATION, SMALL INTESTINE, INTESTINAL DISACCHARIDES (1782)*
- LACTOSE
  - ABSORPTION, ZINC, RETENTION (1642)
  - MALABSORPTION, STOMACH, SURGERY (1964)
- LECITHIN
  - TRANSMETHYLATION, BIOCHEMISTRY, AGE FACTORS (1695)*
- LEIOMYOBLASTOMA
  - STOMACH, MUCOSA, NEOPLASM (1576)*
- LEIOMYOMA
  - ESOPHAGUS, EPIPHRENIC DIVERTICULUM (1846)
  - JEJUNUM (1944)
- LEUCINE TRANSFER
  - LIVER, RNA, PLASMA CELL TUMOR (1777)
- LEUKEMIA
  - LYMPHOCYTIC, CHRONIC, PULMONARY DISEASE, PNEUMATOSIS CYSTOIDES, INTESTINALIS (1980)
  - LYMPHOMA, ESOPHAGUS (1839)
- LIPASE
  - PANCREATIC, SPECIFICITY OF TRIGLYCERIDE (1687)*
- LIPID
  - COLON, HISTOCHEMISTRY, ULTRASTRUCTURE (1582)*
  - COMPOSTION, LIVER, MORRIS HEPATOMA 5123, CYTOPLASMIC FRACTION (2077)
  - DIETARY, LIPOGENESIS, LIVER, MAMMARY GLAND (1751)
  - LIVER, LOBE LIGATION, RAT (1597)
- LIPID ABSORPTION
  - STOMACH, RESECTION (1886)
- LIPIDOSIS
  - TAY-SACHS' DISEASE, BIOCHEMISTRY, CEREBRAL AND HEPATIC LIPIDS (2059)

LIPOGENESIS
- HEPATOMAS, LACK OF ADAPTATION (1766)
- LIVER, FATTY ACID SYNTHESIS, ENZYMES (1716)*
- LIVER, MAMMARY GLAND, DIETARY FAT (1751)

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- 6-PHOSPHOGLUCONATE DEHYDROGENASE, SHEEP (1604)
- ABSCESS, AMEBIASIS, HEPATITIS (2089)
- ABSCESS, AMEBIASIS, PERICARDITIS (2074)
- ACUTE DAMAGE, ALCOHOLISM (2021)
- ACUTE HEPATIC FAILURE, CHILDREN, CAUSE, TREATMENT (2090)
- ADHESIVE PERIHEPATITIS, SURGERY (2101)
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- ALCOHOL DEHYDROGENASE, COENZYME BINDING SITES, CATALYTIC SITES, AROMATIC ALDEHYDE REDUCTION, HORSE (1753)
- ALDOLASES, HEPATOMA, ANTIBODIES (1703)*
- ALLOGRAFT, XENOGRAFT, PRIMATE (1583)*
- AMEBIASIS, SURGERY, HEPATITIS (2087)
- AMEBIC ABSCESS, INFECTIOUS HEPATITIS CIRRHOSIS, CARCINOMA (2058)
- AMEBIC HEPATITIS, AMEBIC ABSCESS, CONNECTIVE TISSUE (2039)
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- BILHARZIASIS, BILE PIGMENT, SCHISTOSOMIASIS (2244)
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- BILIARY TRACT, ISONIAZIDE (1733)
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- BIOCHEMISTRY, ENZYMES, HEPATOMA (1728)
- BIOCHEMISTRY, MICROSOME, ANESTHESIA, DRUG EFFECTS (1727)
- BIOCHEMISTRY, NUCLEIC ACID METABOLISM REGENERATION, PATHOLOGY, TRACER STUDIES (1718)*
- BLOOD FLOW, GLUCAGON, DOG (1790)*
- BRUCELLA TITER, TUBERCULOSIS (2086)
- CANCER, CIRRHOSIS, SCANNING (1803)*
- CANCER, FETOPROTEIN, SERUM (2073)
- CARBON TETRACHLORIDE POISONING, MUCOPOLYSACCHARIDE SYNTHESIS, PASSIVE BINDING (1715)*
- CARCINOMA, ELECTRON SPIN RESONANCE, AMINOACETYL FLUORENE (1759)
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- CATALASE, RHEUMATOLOGY, GOUT (1731)
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- CIRCULATION, SURGERY (1792)
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(1779)
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- LIVER, NUCLEOSIDE DIPHOSPHATASE, RAT (1603)
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- PERISTALSIS, BLOCKADE (1653)
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- GASTROINTESTINAL TRACT, HYPOSPLENISM, CELIAC DISEASE (1966)
- IMMUNOGLOBULINS, SPRUE, NON-TROPICAL, SMALL INTESTINE (1962)*
- LACTOSE, STOMACH, SURGERY (1964)
- RETICULUM CELL SARCOMA, STEATORRHEA (1967)
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- LIVER, MITOCHONDRIA, ENZYME (1713)*
- LIVER, SULFUR, WILSON'S DISEASE (2040)
- PROTEIN, NUCLEIC ACID, ENZYME, LIVER (1710)*
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- LIVER, CALCIUM UPTAKE, POTASSIUM PERMEABILITY (1620)
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- LIVER, ENZYME, SEPARATION (1578)*
- LIVER, HALOTHANE, ELECTRON TRANSPORT OXIDATIVE PHOSPHORYLATION, RAT (1707)*
- LIVER, MECHANISM, UNCOUPLERS, PHOSPHATE (1779)
- LIVER, METABOLISM, ENZYME (1713)*
- LIVER, PROTEIN CONTENT, MEMBRANE (1588)
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- STOMACH, ANTRAL POUCHES, DENERVATED (1645)*
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- GASTRIC, DUODENUM, JEJUNUM, BACTERIAL FLORA (2190)*
- GASTRIC, SECRETION, ANESTHETICS, FROG (1681)
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  - ABSCESS, ACUTE PANCREATITIS (2029)
  - ACUTE DAMAGE, ALCOHOLISM (2021)
  - ACUTE PANCREATITIS, ALPHA AMYLASE, SERUM TRANSAMINASES (2027)*
  - ACUTE PANCREATITIS, POLYA GASTRECTOMY AFFERENT-LOOP OBSTRUCTION (1789)
  - ALCOHOL, EXOCRINE, FUNCTION, ULTRASTRUCTURE, ACINAR CELLS (1580)*
  - CANCER, CHRONIC LESIONS, DIABETES (2024)
  - CARCINOMA, CHRONIC PANCREATITIS (2031)
  - CARCINOMA, DIAGNOSIS, RETROPERITONEAL GAS STUDY (2023)
  - CELLULAR MORPHOLOGY, BLOOD FLOW, ENZYMES, PANCREOZYMIN, ZYMOGEN (1572)*
  - DIABETES MELLITUS, FAT ABSORPTION, INSULIN (1624)*
  - ENZYME, ISOLATION, PORCINE (1590)
  - ENZYME, PROTEIN, DIET (1573)*
  - ETHANOL, DL-ETHIONINE, PROTEIN DEFICIENCY, LEUCINE AMINOPEPTIDASE, RAT (1683)*
  - EXOCRINE SECRETION, METHODOLOGY (1690)
  - FIBROCYSTIC DISEASE, NEW ZEALAND (2018)
  - HYPOKALEMIA, ZOLLINGER-ELLISON SYNDROME (2176)
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  - ISLET CELL, ADENOMA, HYPERINSULINISM DIAGNOSIS, TREATMENT (2019)
  - ISLET OF LANGERHANS, INSULIN, HISTOLOGY (1685)*
  - ISLET OF LANGERHANS, ULTRASTRUCTURE, ISLET CELLS, ALLOXAN TOXICITY, B GRANULES, A GRANULES (1694)*
  - PANCREATECTOMY, HYPERINSULINISM (2016)
  - PANCREATIC DUCT, HEMORRHAGE, ANGIOGRAPHY (2017)
  - PANCREATIC DUCT, INTRADUCTAL PRESSURE, PANCREATITIS, METHODOLOGY (2032)
  - PANCREATIC LIPASE, TRIGLYCERIDE, GOMORI TECHNIQUE, SPECIFICITY OF PANCREATIC LIPASE ACTIVITY (1687)*
  - PANCREATITIS, CHRONIC, SURGICAL TREATMENT (2028)
  - PANCREATITIS, SULFONAMIDES (2030)
  - PARTIAL PANCREATECTOMY, TRANSPLANTABLE PITUITARY TUMORS, HORMONALLY INDUCED DIABETES, SPLANCHNOMEGALY, RAT (1691)
  - SCANNING, LABELED SELENOMETHIONINE, PANCREATIC FUNCTION (2025)
  - SECRETIN, CYCLIC AMP, SECRETION (1689)
  - SECRETION, NERVOUS CONTROL, BICARBONATE, ENZYME, ACETYLCHOLINE (1686)*
  - SECRETION, NERVOUS CONTROL, PANCREOZYMIN, CIRCULATION, HORMONE (1688)*
  - STIMULATION, BLOOD ENZYME LEVEL, HISTOLOGY (1693)
  - SURGERY, PAPILLOTOMY, TRANSDUODENAL SPHINCTEROTOMY (1956)
  - TOTAL PANCREATECTOMY, HYPOGLYCEMIA HORMONE REPLACEMENT (1692)
  - TUMOR, ZOLLINGER-ELLISON SYNDROME, TOTAL GASTRECTOMY (2240)
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  - TUMOR, ZOLLINGER-ELLISON SYNDROME, ACHLORHYDRIA, ATROPHIC GASTRITIS (1887)
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  - TUMOR, ZOLLINGER-ELLISON SYNDROME, DIAGNOSIS (2235)
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  - HYPERINSULINISM, PANCREAS (2016)
- PANCREATIC DUCT
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- PANCREATITIS
  - ACUTE, ALPHA AMYLASE, SERUM TRANSAMINASES, ENZYMES (2027)*
  - ACUTE, HEMORRHAGIC, INTRADUCTAL PANCREATIC PRESSURE, METHODOLOGY (2032)
  - ACUTE, PANCREAS, ABSCESS (2029)
  - ACUTE HEMORRHAGIC, PLASMA KININS, FORMATION AND DESTRUCTION, DOG (2026)*
  - AFFERENT-LOOP OBSTRUCTION, POLYA GASTRECTOMY (1872)
  - CHRONIC, CARCINOMA, PANCREAS (2031)
  - CHRONIC, SURGICAL TREATMENT (2028)

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(2081)
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(2038)*
JAUNDICE, CONGENITAL NONOBSTRUCTIVE NONHEMOLYTIC, INFANT
(2037)*
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(1709)*
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(2014)
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(1974)*
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MULTIPLE, PEUTZ-JEGHERS SYNDROME, PLURICYSTIC RENAL DISEASE
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  - GASTRIC, CYCLIC AMP, PANCREAS, SECRETIN (1689)
  - GASTRIC, INHIBITION, LIPOPOLYSACCHARIDE, ADRENERGIC BLOCKING AGENTS (1666)*
  - GASTRIC, METHODOLOGY, DUODENAL ULCER (1678)
  - HEIDENHAIN POUCH, GANGLIONIC BLOCKING AGENTS, GANGLIONIC STIMULANTS, DOG (1677)
  - LIVER, COPPER, CERULOPLASMIN (1702)*
  - LIVER, PIGMENT, BILIRUBIN (1734)
  - PANCREAS, BICARBONATE, ENZYME, EXOCRINE, ACETYLCHOLINE (1688)*
  - LIVER, TRANSPORT, CHLOROGUANIDE-TRIAZINE (1717)*
  - PANCREAS, NERVOUS CONTROL, ENZYME, ACETYLCHOLINE (1686)*
  - STOMACH, FUNCTION, MUSIC EFFECTS (1673)*
  - STOMACH ACID, HYPERCHLORHYDRIA (1860)*
- SECRETORY INHIBITORS
  - MUCOSAL BLOOD FLOW, AMINOPYRINE-CLEARANCE VASOPRESSIN, GASTRIN (1672)*
- SEPTICEMIA
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- SERINE
  - METABOLISM, PORTACAVAL SHUNT, RAT (1704)*
- SEX FACTOR
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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabolic Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology have accompanying abstracts.

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. For journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans
Ar.	Arabic
Bul.	Bulgarian
Ch.	Chinese
Cz.	Czech
Dan.	Danish
Dut.	Dutch
E.	English
Eston.	Estonian
Fin.	Finnish
Fl.	Flemish
Fr.	French
Ger.	German
Gr.	Greek
Heb.	Hebrew
Hun.	Hungarian
Ic.	Icelandic
In.	Indonesian
It.	Italian
Jap.	Japanese
Kor.	Korean
Latv.	Latvian
Lith.	Lithuanian
Nor.	Norwegian
Pol.	Polish
Por.	Portuguese
Rum.	Rumanian
Rus.	Russian
Ser.	Serbo-Croatian
Sl.	Slovak
Sp.	Spanish
Sw.	Swedish
Th.	Thai
Turk.	Turkish
Uk.	Ukrainian
Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone
ADP	adenosine diphosphate
AMP	adenosine monophosphate
ATP	adenosine triphosphate
BSP	sulfobromophthalein
C	degrees centigrade
cm	centimeter(s)
CNS	central nervous system
cpm	counts per minute
DNA	deoxyribonucleic acid
e.g.	for example
g	gram(s)
μg	microgram(s)
hr	hour(s)
i.m.	intramuscular
i.p.	intraperitoneal
IU	international unit(s)
i.v.	intravenous
kg	kilogram(s)
LD_{50}	median lethal dose(s)
LDH	lactic acid dehydrogenase
m	meter(s)
M	molar
mEq	milliequivalent(s)
mM	millimolar
μM	micromolar
mC,μC	milli-,microcurie(s)
mg	milligram(s)
min	minute(s)
ml	milliliter(s)
mm	millimeter(s)
MTD	maximum tolerated dose
ng	nanogram (10^{-9})
pg	picogram (10^{-12})
p.o.	orally
ppm	parts per million
r	Roentgen
RBC	red blood cells (erythrocytes), red blood count
resp.	respectively
Rev.	review (only in citations)
RNA	ribonucleic acid
s.c.	subcutaneous
sec	second(s)
SGOT	serum glutamic-oxalacetic transaminase
SGPT	serum glutamic-pyruvic transaminase
U	unit(s)
UV	ultraviolet
WBC	white blood cells (leukocytes), white blood count
yr	year(s)

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

2269 MOLECULAR BASIS OF STRUCTURE AND FUNCTION OF THE MICROVILLUS MEMBRANE OF INTESTINAL EPITHELIAL CELLS. *(E.)* Oda, T. (Okayama U. Med. Sch., Japan), S. Seki and S. Watanabe. *Acta Med Okayama* 23(5):357-376, 1969.

The molecular structure and α-enzyme components (invertase, leucine aminopeptidase, alkaline phosphatase, Mg^{+2}-activated ATPase) of the microvillus membrane of the epithelial cells of the small intestine of rabbits were determined by biochemical (density gradient centrifugation and column chromatography) and electron microscopic methods. Interference phase contrast and electron microscopy showed that the microvillus membrane was trilaminar with an outer and inner leaflet with a total thickness of 90 to 110 Å. Particles (approximatey 60 Å in diameter and designated as elementary particles) were found repeatedly on the surface of the microvillus membrane and were attached to the membrane trilaminar leaflet. Invertase and leucine aminopeptidase were present in the elementary particles and Mg^{+2}-activated ATPase was localized predominately in the inner surface of the trilaminar structure of the microvillus membrane.

270 THE COMPOSITION OF PHOSPHOLIPIDS IN OUTER AND INNER MITOCHONDRIAL MEMBRANES FROM GUINEA-PIG LIVER. *(E.)* Parkes, J. G. (Dept. Biochem., U. Toronto, Ontario, Canada) and W. Thompson. *Biochim Biophys Acta* 196(2):162-169, 1970.

The enzyme and phospholipid content of isolated mitochondrial and microsomal membranes from guinea pig liver was determined by thin-layer and gas-liquid chromatography. The inner mitochondrial membrane contained high levels of cytochrome c reductase activity and the outer mitochondrial membrane contained high levels of monoamine oxidase activity. Microsomal contamination of the outer mitochondrial membrane was on the order of 15% (based on the assay for NADPH: cytochrome c reductase). Lecithin and phosphatidylethanolamine were the major components in both the outer and inner mitochondrial membranes while cardiolipin was concentrated in the inner membrane and phosphatidylinositol in the outer membrane. The phospholipid content of the microsomes was simi-ar to that of the outer mitochondrial membrane. Fatty acid analysis of the phosphatides in the mitochondrial membranes showed that stearate and palmitate were the major saturated acid components of ecithins and linoleate and oleate the major unsaturated acid components; phosphatidylethanolamine ad the highest stearate and arachidonate content, nd phosphatidylinositol had the highest content of aturated fatty acids.

271 ENZYMATIC AND ULTRASTRUCTURAL EVALUATION OF HEPATIC PRESERVATION IN PRIMATES. *(E.)* onkalsrud, E. W. (U. California Sch. Med., Los ngeles), W. L. Bruckner, J. E. Byfield, G. E. domian and A. Dinbar. *Arch Surg* 100(3):284-289, 970.

hanges in circulating lysosomal enzymes and ultra-tructural appearance of hepatic cells were studied in rhesus monkeys subjected to hepatic ischemia (induced by occlusion of the portal vein and hepatic artery), with and without pretreatment with methylprednisolone or phenoxybenzamine. Activity of serum acid phosphatase and β-glucuronidase was lower and that of serum transaminase was higher in methylprednisolone-pretreated ischemic monkeys than in untreated ischemic monkeys. Pretreatment with phenoxybenzamine decreased serum lysosomal enzyme levels and increased the survival rate in ischemic monkeys. Light microscopic examination of liver biopsies taken after 2 hr of hepatic ischemia revealed midzonal liver necrosis with vacuolization of hepatocytes (these changes were much less pronounced in monkeys pretreated with phenoxybenzamine), depletion of glycogen, a decrease in ribosomes and internal density of mitochondria, and marked dilation of the smooth and rough endoplasmic reticulum. Irregularity of the external mitochondrial membrane and disappearance of mitochondrial granules were observed in biopsies from methylprednisolone-pretreated monkeys. The hepatocellular architecture (mitochondrial membrane, christae and endoplasmic reticulum) was much better preserved in phenoxybenzamine-pretreated ischemic monkeys indicating that this drug may be clinically useful in preparing donors for liver transplantation.

2272 STUDIES ON LIPASE: ISOLATION AND PURIFICATION OF A HIGH MOLECULAR WEIGHT PANCREATIC LIPASE. *(E.)* Ramachandran, S. (Indiana U. Sch. Med., Indianapolis), Y. K. Yip and S. R. Wagle. *Europ J Biochem* 12(2):201-207, 1970.

Lipase from rat pancreas was extracted in potassium phosphate buffer containing sodium deoxycholate and purified by column chromatography on Sephadex and Sepharose gels. A 500-fold purification was achieved, and the enzyme ran as a single protein band in polyacrylamide preparative disc gel electrophoresis. All fractions showed appreciable degrees of lipase activity, the supernatant fraction containing the major portion of activity (38 to 47%). Total recovery of lipase activity from the subcellular fractions was only 70.8 to 85.2% of the whole homogenate and this discrepancy may be accounted for by the loss of material during washing of the fractions. The purified pancreatic lipase catalyzed the hydrolysis of long and short chain fatty acid triglycerides (C4-C16), diglycerides, methyl esters of fatty acids, but not the phospholipids or monoglycerides. Phenoxybenzamine and phentolamine inhibited hydrolysis of the long chain fatty acid glycerol esters by the high molecular weight lipase but not by the low molecular weight lipase. Administration of phenoxybenzamine and phentolamine inhibited the tripalmitin activity of epididymal fat lipase only, whereas the pancreatic or the intestinal lipase activity was not affected.

2273 THE EFFECT OF EXPERIMENTAL MALARIA ON INTRACELLULAR CONCENTRATIONS OF SODIUM AND POTASSIUM IN MUSCLE AND LIVER. *(E.)* Boehm, T. M. (Duke U. Sch. Med., Durham, N. C.) and M. J. Dunn. *Proc Soc Exp Biol Med* 133(2):370-375, 1970.

Experimental malaria was induced in fourteen 2- to 3-kg rhesus monkeys using *Plasmodium knowlesi*, and the changes of intracellular sodium and potassium in erythrocytes, muscle and liver were measured and compared with those of 9 control animals. RBC sodium and potassium were measured in heparinized cells after a triple washing with isosmotic $MgCl_2$ and erythrocyte tissue and plasma sodium and potassium levels were determined by a flame photometer. Muscle H_2O content was unchanged from control percentage (76.6%) in the malarial animals (76.5%). All the animals in the malarial group showed a significant parasitemia which ranged from 17 to 90% of circulating erythrocytes. No differences were observed between the plasma sodium levels in controls and malarial animals (however, some malarial monkeys developed mild hyponatremia secondary to poor H_2O intake at terminal illness). Plasma potassium concentration increased significantly in malarial animals over controls (mean control plasma potassium was 3.9 ± 0.13 mM as compared to the malarial value of 5.3 ± 0.24 mM). In erythrocytes of malarial monkeys the sodium concentration (27.3 ± 2.7 mM/liter RBC) was greater than the control value (11.6 ± 0.92 mM) and the potassium concentration (83.1 ± 3.4 mM) was lower than the control value (98.6 ± 0.87 mM).

2274 5'-NUCLEOTIDASE OF PLASMA MEMBRANES OF THE RAT LIVER: STUDIES ON SUBCELLULAR DISTRIBUTION.

(E.) Song, C. S. (Rockefeller U., N. Y.), A. Kappas and O. Bodansky. *Ann New York Acad Sci* 166(2):565-573, 1969.

The subcellular distribution of 5'-nucleotidase in the liver of Sprague-Dawley rats (based on isolation of individual structural components of the liver cell) was studied by electron microscopy. 5'-Nucleotidase of the rat liver was located solely in the microsomal membranes and when the liver nuclei were isolated in a state virtually free from cytoplasmic membranes, they exhibited no more than a trace of 5'-nucleotidase activity. High concentrations of 5'-nucleotidase activity were present in the plasma membranes and bile cannaliculi of the rat liver and a comparison of specific activities suggested that a large proportion of the 5'-nucleotidase of the microsomal membranes may actually derive from plasma membrane fragments. Because of the low yield of plasma membranes prepared according to the existing methods (1.4% to 3% of the original 5'-nucleotidase activity), it was not possible to estimate quantitatively the fraction of microsomal 5'-nucleotidase activity that could be assigned tc the plasma membrane fragments.

2275 PHOSPHATIDASE SYNTHESIS BY sn-GLYCEROL-3-PHOSPHATE ACYLTRANSFERASE IN PIGEON LIVER PARTICLES.

(*E.*) Husbands, D. R. (Dept. Biol. Chem., U. Michigan, Ann Arbor) and W.E.M. Lands. *Biochim Biophys Acta* 202(1):129-140, 1970.

The properties acyl-CoA:sn-glycerol-3-phosphate acyltransferase from pigeon liver particles were studied by spectrophotometry, paper chromatography and scintillation counting. The apparent K_m for sn-glycerol-3-phosphate was 50 μM and acyl-CoA inhibited the enzyme at concentrations exceeding 60 μM, which could be overcome by adding extra protein. Inhibition of the enzyme by thiol-binding agents was prevented by preincubation of the enzyme with acyl-CoA. The amount of the thiol group protected per mg enzyme protein was estimated by adding radioactive N-ehtylmaleimide in the presence of glycerol phosphate. No evidence was obtained for required sulfhydryl groups other than those protected by acyl-CoA. In the presence of bovine serum albumin, several different acyl-CoA derivatives were esterified to sn-glycerol-3-phosphate at very similar rates.

2276 SUBCELLULAR DISTRIBUTION OF TRYPSINOGEN AND CHYMOTRYPSINOGEN IN RABBIT PANCREAS.

(*E.*) Rothman, S. S. (Harvard Med. Sch., Boston, Mass.). *Amer J Physiol* 218(2):372-376, 1970.

Studies of homogenates of rabbit pancreas showed that about 33.3% of the total yield of trypsinogen activity was found in the postmicrosomal supernatant fraction. Only about 50% of this amount of the chymotrypsinogen yield was located in the supernatant. This variance was made up in approximately equal parts by other fractions, each of which contained a slightly greater yield of chymotrypsinogen than trypsinogen. This asymmetric distribution of two structurally similar proteins suggested that a generalized lysis of enzymes from particulate subcellular organelles may not account for all the exportable enzyme content of the postmicrosomal supernatant. In a previous study it was found that pancreozymin produced a trypsinogen-dominant secretion (relative to chymotrypsinogen) when it was placed in a solution bathing a rabbit pancreas *in vitro*. As an initial attempt to determine whether or not this response was due to selective transport of trypsinogen or to an alteration in the rate of its synthesis, pancreozymin was given to rabbits and the subcellular distribution of trypsinogen and chymotrypsinogen was subsequently determined. The only change in the relative distribution of chymotrypsinogen and trypsinogen was a decrease in the trypsinogen activity recovered from the postmicrosomal supernatant. This was consistent with the secretory response to pancreozymin being the result of altered transfer rates of enzyme.

2277 SUBCELLULAR DISTRIBUTION OF COPPER IN RAT LIVER AFTER BILIARY OBSTRUCTION.

(*E.*) Worwood, M. (Inst. Cancer Res., Belmont, Sutton, Surrey, England) and D. M. Taylor. *Biochem Med* 3(2):105-116, 1969.

Subcellular distribution of copper was compared in liver of normal rats and rats subjected to bile duct ligation and daily copper solution injections. Total protein percentages in nuclear fractions was substantially increased, apparently at the expense of mitochondrial, lysosomal and microsomal fractions, since the proportion of total protein in the soluble fraction was not reduced. Retention of ^{64}Cμ in 4 control livers was found to be 9.5 ± 1.9% of the injected dose at 43 hr post injection, while in 2 rats with ligated bile ducts and liver copper concentration of 105 and 102 μgm/gm, the livers retained 51 and 58%, resp., of injected ^{64}Cμ. Bile duct ligation and copper injections increased the total liver copper content by more than 17 times and there was a marked change of the subcellular distribution pattern as compared to controls. Most hepatic ^{64}Cμ was found in the soluble fraction in normal rats, but following bile duct ligation and copper injection, most of the hepatic ^{64}Cμ was associated with formed elements of the cells, especially lysosomes. Further fractionation of the soluble fraction on Sephadex G-200 showed that bile duct ligation and copper injection caused a change in normal distribution of ^{64}Cμ among the proteins of this fraction. The combined procedure of bile duct ligation and copper administration does produce high hepatic copper levels somewhat analogous to those seen in human biliary cirrhosis and the close similarity between ^{64}Cμ and lysosomal enzyme distribution indicates that much of the excess copper seemingly is associated with lysosomal particles.

2278 SOLUBLE AND MEMBRANE-ASSOCIATED FORMS OF ACID PHOSPHATASE ASSOCIATED WITH THE LYSOSOMAL FRACTION OF RAT LIVER.

(E.) Sloat, B. F. (Dept. Zool., U. Michigan, Ann Arbor) and J. M. Allen. *Ann New York Acad Sci* 166(2):574-601, 1969.

Two acid phosphatases associated with lysosomal fractions derived from rat liver were identified after electrophoresis in acrylamide gels. One form was a rapidly migrating enzyme released after physical disruption of lysosomal fractions and the other form was electrophoretically mobile only after treatment of lysosomal fractions with 5% Triton-X-100 (this enzyme was associated with lysosomal membranes and was about 40% of the total acid phosphatase of the lysosomal fraction). These membrane-associated and soluble forms were individually isolated by a preparative electrophoretic technique and stability was maintained after reelectrophoresis singly or as mixtures. The soluble enzyme and the Triton-solubilized bound enzyme show identical activity profiles when subjected to density equilibrium centrifugation in sucrose: water gradients, indicating that the bound form is released from the membranous components. Biochemical assays of fractions derived by differential and density gradient centrifugation combined with photometric assay after electrophoresis showed that both soluble and membrane-bound forms are associated with the lysosomal population. Biochemical studies of lysosomal supernatant preparations indicated that the membrane-associated acid phosphatase is heat stable (50°C for 80 min) in contrast to the soluble enzyme, which lost 70% of its activity under these conditions. Bound and soluble enzymes possess a similar pH optimum and respond to inhibition by L-tartrate, fluoride, alloxan and formaldehyde in the same manner. Studies of regenerating and control liver undertaken at 24, 48 and 72 hr after partial hepatectomy, showed a distributional shift of acid phosphatase toward an association with lighter particles (after differential and density gradient centrifugation), and this shift was related to a change in the characteristics of the lysosomal population rather than to any association with the elements of the endoplasmic reticulum. Biochemical and electrophoretic data indicated that lysosomal fractions derived from regenerating liver contain a larger proportion of bound to soluble enzyme than fractions from control animals (albino male rats). A proportionately larger amount of bound enzyme may be associated with a more slowly sedimenting and smaller population of lysosomes.

2279 CHANGE IN Δ^4-STEROID HYDROGENASE ACTIVITY IN RAT LIVER AFTER TUMOR IMPLANTATION.

(E.) Konishi, G. (Tokyo Med. Dent. U., Japan). *Bull Tokyo Med Dent Univ* 16(1):37-46, 1969.

The mechanism of altered metabolism of steroid hormones in tumor-bearing animals was studied using Δ^4-steroid hydrogenase activity determinations in Wistar strain rat liver after Rhodamine sarcoma implantation (cortisol, cortisone and corticosterone were used as substrates for the enzyme activity measurements). After tumor implantation, Δ^4-steroid hydrogenase activity increased for a week, then gradually decreased as the tumor grew, and the low level of activity was maintained for 5 weeks, when the implanted tumors were totally extirpated. After extirpation, Δ^4-steroid hydrogenase activity in the liver of the surviving rats returned rapidly to its normal level and was maintained in a two week period.

2280 STRUCTURAL STUDIES ON ADENOSINE DEAMINASE FROM CALF INTESTINAL MUCOSA.

(E.) Phelan, J. (U. Calif., Dept. Biochem., Berkeley), F. McEvoy, S. Rooney and T. G. Brady. *Biochim Biophys Acta* 200(2):370-377, 1970.

The amino acid composition of adenosine deaminase from calf intestinal mucosa was determined by electrophoresis and column and paper chromatography. There were three tryptophan-containing peptides, fourteen arginine-containing peptides and fourteen tyrosine-containing peptides, giving a molecular weight of 34,500. Alkylation studies of native, denatured, and denatured-reduced enzymes showed that no sulfhydryl groups reacted in the native molecule, two reacted in the denatured molecule, and four in the denatured-reduced enzyme. Peptide mapping confirmed the molecular weight of the enzyme and showed that electrophoretically distinct forms of the enzyme were similar in primary structure.

2281 STUDIES ON THE FINE STRUCTURE OF LARGE SUBUNITS OF RIBOSOMES FROM MOUSE LIVER.

(E.) Florendo, N. T. (Yale U. Med. Sch., New Haven, Conn.) and L. B. Foster. *J Ultrastructure Res* 30(1-2):1-6, 1970.

The fine structure of polysomes and large subunits prepared from neonatal mouse liver was studied by electron microscopy. The resolution of the intact polysomes into large and small subunits is not distinct but a central or eccentric opacity measuring 30-50 Å in diameter is seen in approximately 20% of all the polysomes observed and may represent the cleft between subunits. Central opacities observed in the isolated large subunits may represent a "channel" through the large subunit.

2282 THE INFLUENCE OF ALLOXAN-DIABETES AND FASTING ON GLYCOLYTIC AND GLUCONEOGENIC ENZYME ACTIVITIES OF RAT INTESTINAL MUCOSA AND LIVER. *(E.)*

Anderson, J. W. (U. California Med. Ctr., San Francisco) and D. Zakim. *Biochim Biophys Acta* 201(2):236-241, 1970.

The effects of alloxan-diabetes and fasting on glycolytic and gluconeogenic enzyme activities (nmoles NADPH/min/mg supernatant protein) in rat jejunal mucosa were studied using standard assays and compared to their effects on the liver. Jejunal hexokinase activity for the diabetic rat (17.8) was similar to that of the control (18.7) but was lower than that in the fasted animal (11.0). In the liver, hexokinase activity was similar for all three groups (3.0, 2.8 and 2.6). Pyruvate kinase activity in the jejunum was similar for the diabetic (691) and control (568) rats and lower for the fasted rat (384); in the liver the activity was lower than the control (277) for both the diabetic (74) and fasted (119) groups. Gluconeogenic enzyme activities in the jejunum for the control (14.4) and diabetic (14.6) animals are the same while for the fasted animal (21.1) it is 50% higher. In the liver, both the diabetic (112) and fasted (110) animals show higher activities than the control (79). Fasting and diabetes have different effects on glycolytic and gluconeogenic enzyme activities and the changes in jejunal mucosa do not always parallel those in the liver.

2283 PREPARATION OF A PLASMA MEMBRANE FRACTION FROM RAT LIVER BY ZONAL CONFIGURATION. *(E.)*

Hinton, R. H. (Wolfson Bioanalyt. Ctr., U. Surrey, London, England), M. Doreota, J. T. R. Fitzsimons and E. Reid. *Europ J Biochem* 12(2):349-361, 1970.

The behavior of heavy subcellular particles from rat liver during centrifugation in an A-XII zonal rotor was studied using enzymic markers and light and electron microscopy. The livers were perfused with warm 0.25 M sucrose-5mM $NaHCO_3$ with a pH of 7.5 and homogenization and resuspension of the nuclear fraction were carried out in the same medium. Zonal centrifugation gave a band of plasma membrane fragments which showed a 14-fold increase in 5'-nucleotidase specific activity over the homogenate and this purification was increased to 30-fold by vigorous rehomogenization in sucrose of density 1.19 followed by flotation of the plasma membrane fragments. The resultant fraction was almost free of succinate-dehydrogenase activity although still possessing some glucose-6-phosphatase and acid β-glycerophosphatase activity.

2284 ON THE POSSIBILITY OF METABOLITE CONTROL OF LIVER GLYCOGEN SYNTHESASE ACTIVITY. *(E.)*

Gold, A. H. (St. Louis U. Sch. Med., Mo.). *Biochemistry* 9(4):946-952, 1970.

The effect of various nucleotides on the activity of nonactivated and *in vitro* activated forms of liver glycogen synthetase was studied using an enzyme preparation to represent the total liver glycogen synthetase activity. ATP, UTP, and UDP were shown to be inhibitors of the activity of both nonactivated and *in vitro* activated enzyme and ATP inhibited the activities of both enzyme forms by competing with the substrate UDP-glucose. In the presence of an excess amount of the activator glucose 6-phosphate, a partial reversal of ATP inhibition of activity of nonactivated enzyme was observed while in the presence of magnesium, a limiting amount of glucose 6-phosphate was effective in reversing nucleotide inhibition of synthetase activity. The magnesium ion-dependent increase in nonactivated synthetase affinity toward glucose 6-phosphate was decreased by ATP. The liver glycogen synthetase activity apparently can be regulated by an effect of the nucleotide on enzyme affinity toward the hexosephosphate activator.

2285 HEAT INACTIVATION AND SEPHADEX CHROMATOGRAPHY OF THE SMALL-INTESTINE DISACCHARIDASES OF THE CHICK. (*E.*)

Siddons, R. C. (Nat. Inst. Research Dairying, Shinfield, Reading, U. K.). *Biochem J* 116(1):71-78, 1970.

The maltase, sucrase, isomaltase and palatinase activities of the chick small intestine were localized in particles that sediment when centrifuged at 100,000 g for 90 min. Solubilization of the particle-bound dissacharidases without loss of activity was achieved by digestion with papain. Trypsin was less effective and caused a preferential solubilization of the sucrase, isomaltase and palatinase activities. On Sephadex G-200 columns, the solubilized preparations yielded two dissacharidase peaks. The first peak was eluted close to the void volume of the column and contained all the sucrase, isomaltase and palatinase activities and some of the maltase activity. The remainder of the maltase activity was eluted beyond the total volume of the column. Precipitation with ethanol did not affect the behavior of the dissacharidases of gel filtration. The maltase activity of the second peak on rechromatography in a buffer containing 0.01 M maltose was eluted close to the void volume. Similar pH optima but different K_m values were obtained for the maltase activities for the two peaks. Heat inactivation studies showed that the first peak contained two dissacharidase enzymes; one hydrolysed sucrose and maltose and the other hydrolysed isomaltose, palatinose and maltose. The second peak contained three dissacharidase enzymes all specific for the hydrolysis of maltose. It appears that the intestinal disaccharidases of the chick exist in the form of 2 complexes: a sucrase-isomaltase complex and a maltase complex.

2286 THE INTRAMITOCHONDRIAL DISTRIBUTION OF SOME ENZYMES INVOLVED IN THE BIOSYNTHESIS OF RAT-LIVER PHOSPHOLIPIDS. *(E.)*

Sarzala, M. G. (Nencki Inst. Exper. Biol., Warsaw, Poland), L. M. G. Van Golde, B. De Kruyff and L. L. M. Van Deenen. *Biochim Biophys Acta* 202(1):106-119, 1970.

The conversions of 1- and 2-acyl-sn-glycero-3-phos-
ɔhorylcholine into 3-sn-phosphatidylcholine, of 1-
ıcyl-sn-glycero-3-phosphate into 1,2-diacyl-sn-
;lycero-3-phosphate, and of 1,2-diacyl-sn-glycerols
into 3-sn-phosphatidylcholine and triacyl-glycerols
ɹere studied in microsomes, mitochondria and sub-
nitochondrial fractions from rat liver and compared
ɹith the distribution of glucose-6-phosphatase,
:otenone-insensitive NADH-cytochrome c reductase,
:ytochrome oxidase and succinate dehydrogenase.
fitochondria contained acetyltransferases involved
.n the conversion of both isomeric mono-acyl-sn-
;lycero-3-phosphorylcholines into 3-sn-phosphatidyl-
:holine and of 1-acyl-sn-glycero-3-phosphate into
.,2-diacyl-sn-glycero-3-phosphate (these processes
ɹere found to occur predominantly in the outer mem-
ɔrane fraction). Mitochondria and mitochondrial
ɜubfractions did not catalyze significantly the
:onversion of 1,2-diacyl-sn-glycerols with (^{14}C)
:DP-choline into 3-sn-phosphatidylcholine or that
ɔf 1,2-diacyl-sn-glycerols with (^{14}C)fatty acids
.nto triglycerols. Simultaneous incubation of sn-
(2-^{3}H)glycero-3-phosphate and (^{14}C)fatty acids with
ɜubmitochondrial fractions demonstrated that sn-
;lycero-3-phosphate was converted (in the presence
ɔf outer membranes) into 1,2-diacyl-sn-glycero-3-
ɔhosphate. The uptake of fatty acids into these
hospholipids apparently proceeds mainly via acety-
ation of their mono-acyl derivatives.

287 δ-AMINOLEVULINIC ACID SYNTHETASE: IN-
DUCTION IN EMBRYONIC CHICK LIVER BY GLU-
AGON. (*E.*) Simons, J. A. (Dept. Biol. Coll. William
ınd Mary, Williamsburg, Va.). *Science* 167(3923):
.378-1379, 1970.

'he synthesis of δ-aminolevulinic acid synthetase
measured by the amount of δ-aminolevulinic acid
ormed) was studied in 18-day-old chick embryos in-
ected with glucagon, cycloheximide, cyclic AMP, and
ibutyryl cyclic AMP. The δ-aminolevulinic acid
ynthetase activity in the liver of untreated 18-day-
ld chick embryos was 8 nmole of δ-aminolevulinic
cid formed per gram of liver per hour and was rela-
ively uniform among individual embryos. Glucagon
roduced a twofold increase in δ-aminolevulinic acid
ynthetase activity and the increase was prevented
y cycloheximide-induced inhibition of protein syn-
hesis and was not affected by dactinomycin-induced
nhibition of RNA synthesis or by cyclic AMP. The
egulatory mechanism for glucagon-induced increase
n δ-aminolevulinic acid appears to be nongenetic.

288 PHYLOGENETIC VARIATION OF RODENT LIVER ES-
TERASES. (*E.*) Holmes, R. S. (Dept. Biochem.,
ueensland U., Brisbane, Australia) and E. J. Massaro.
Exp Zool 172(3):323-334, 1969.

iver esterase zymograms of representatives of 21
pecies of rodents and of 3 inbred strains of *Mus* -
usculus were sufficiently variable to reflect
pecies differences. One group of esterases (the
ajor liver carboxylesterases) indicated phylogenetic
elations. The carboxylesterases of the *Myomorph*
pecies exhibited a distinct multiple banding pattern.
he species of *Caviidae* and *Hystricidae* also had characteristic patterns of esterase activity. Using characteristics of the zymograms patterns such as degree of multiplicity, electrophoretic mobility, inhibitor specificity and heat lability of the major liver carboxylesterases, it was possible to arrange the rodent species into groups which were in accord with classical phylogeny. Studies of polymorphism of liver esterases from inbred strains of mice indicated that the multiple band phenotype of the major liver carboxylases was fixed or in high frequency in the population. Other carboxylesterases and the cholinesterases were variable within a species and were of little use in phylogenetic comparisons.

2289 α-AMINOADIPATE AMINOTRANSFERASE OF RAT LIVER MITOCHONDRIA. (*E.*) Nakatani, Y. (Coll. Biomed. Technol., Osaka U., Toyonaka, Japan), M. Fujioka and K. Higashino. *Biochim Biophys Acta* 198(2):219-228, 1970.

α-Aminoadipate aminotransferase, partially purified from rat liver mitochondria, catalyzes a reversible transamination between α-aminoadipate and α-ketoglutarate. The α-aminoadipate is metabolized to α-ketoadipate by a transamination reaction with α-ketoglutarate in the cell compartment. The aminotransferase has a loosely bound coenzyme; a prolonged dialysis of enzyme against phosphate buffer resulted in a high loss of its catalytic activity. The enzymic activity of the apoenzyme was restored by either pyridoxal or pyridoxamine phosphate. The equilibrium constant of the reaction was about 1.32 at pH 7.5 and at 37°, and the Michaelis constants for α-aminoadipate, glutamate, α-ketoadipate, and α-ketoglutarate were 9.0, 5.0, 0.5 and 1.3 mM, resp. α-Aminoadipate aminotransferase has a strict substrate specificity; in transamination with α-ketoglutarate, α-aminopimelate and norleucine were 14% and 15% active in place of α-aminoadipate, whereas the other amino acids tested were inert as substrates.

2290 ULTRASTRUCTURAL CHANGES IN THE MUCOSA OF FROZEN-PRESERVED CANINE ILEUM. (*E.*) Barchi, R. L. (Sch. Med. U. Pennsylvania, Philadelphia), B. S. Lundy, R. Hamilton and H. B. Lehr. *Cryobiology* 6(3):211-226, 1969.

Serial ultramicroscopic observations were made on 4 segments of canine ileum frozen to -50°C after use of 10% glycerol solution as a cryoprotectant. The observed alterations in the cellular structure were progressive in degree during the perfusion, frozen and thawed, and revascularized stages. Normal fine structure was evident in the cells studied 1 month after freezing. There was a wide variation in the response of individual cells to the freezing process. Changes observed in the epithelial cells included swelling of the mitochondria, distention and vesiculation of the endoplasmic reticulum and rounding with dilation of the cisternal profiles of the Golgi apparatus. In the terminal stages prior to cell disruption, fragmentation of the microvilli was observed. Consistent or typical changes in the nuclei were not identified in this study. In the lamina propria, the capillary endothelium retained its integrity during perfusion but showed mitochondrial swelling. Late changes following freezing included disruption of the endothelial cytoplasm. Minimal changes in smooth muscle cells were observed but included decrease in peripheral myofibrils and increase in condensed nuclear chromatin. Plasma cells were relatively unaffected by perfusion but showed vesiculation of the endoplasmic reticulum after freezing and thawing.

2291 PURIFICATION AND MOLECULAR PROPERTIES OF PLACENTAL AND INTESTINAL ALKALINE PHOSPHATASES. *(E.)* Ghosh, N. K. (Roger Williams Gen. Hosp., Providence, R. I.). *Ann New York Acad Sci* 166(2):604-640, 1969.

2292 THE PURIFICATION AND PROPERTIES OF FORMAMIDASE FROM RAT LIVER. *(E.)* Shinohara, R. (Gifu Coll. Pharm., Japan) and I. Ishiguro. *Bichim Biophys Acta* 198(2):324-331, 1970.

2293 KINETIC CHARACTERISTICS OF SELECTED OXIDASES IN SHEEP LIVER HOMOGENATE. *(E.)* Rao, K. V. K. (Dept. Zool., Sri Venkateswara U. Tirupati, India) and K. S. Swami. *Arch Int Physiol Biochem* 77(5):812-818, 1969.

2294 STUDIES ON ATP CITRATE LYASE OF RAT LIVER: V. THE BINDING SITE OF PHOSPHATE. *(E.)* Suzuki, F. (Osaka U. Dent. Sch., Japan), K. Fukunishi and Y. Takeda. *J Biochem* 66(6):767-774, 1969.

2295 THE METAPHASE CHROMOSOMES OF CHINESE HAMSTER LIVER CELLS FOLLOWING PARTIAL HEPATECTOMY. *(E.)* Brooks, A. L. (Lovelace Found. Med. Educ. Res., Albuquerque, New Mexico) and D. K. Mead. *Canad J Genet Cytol* 11(4):794-798, 1969.

2296 THE ULTRASTRUCTURE OF THE HEPATIC INTERCELLULAR SPACES IN CERTAIN DISEASES. *(E.)* Pavel, I. (Cantacuzino Hosp., Bucarest, Rumania), S. Campeanu, H. Bonaparte and A. Petrovici. *Path Microbiol* 34(1):35-44, 1969.

2297 ISOLATION OF GOLGI APPARATUS FROM RAT LIVER: III. LIPID AND PROTEIN COMPOSITION. *(E.)* Yunghans, W. N. (Dept. Botany, Purdue U., Lafayette, Indiana), T. W. Keenan and D. J. Morre. *Exp Molec Path* 12(1):36-45, 1970.

2298 INHIBITION OF DRUG-METABOLIZING ENZYMES OF LIVER MICROSOMES BY HYDRAZINE DERIVATIVE IN RELATION TO THEIR LIPID SOLUBILITY. *(E.)* Kato, R. (Natl. Inst. Hyg. Sci., Tokyo, Japan), A. Takanaka and H. Shoji. *Jap J Pharmacol* 19(2):315-322, 1969.

2299 CHANGES IN THE PHYSICAL STATE OF DNA DURING REPLICATION IN THE REGENERATING LIVER OF THE RAT. *(E.)* Berger, H., Jr. (Sch. Med., U. North Carolina, Chapel Hill) and J. L. Irvin. *Proc Nat Acad Sci* 65(1):152-159, 1970.

2300 MECHANISM OF THE INACTIVATION OF GUINEA PIG LIVER TRANSGLUTAMINASE BY TETRATHIONATE. *(E.)* Chung, S. I. (Natl. Inst. Dent. Res., Natl. Inst. Hlth., Bethesda, Md.) and J. E. Folk. *J Biol Chem* 245(4):681-689, 1970.

2301 ENZYMATIC MODIFICATION OF PROTEINS: II. PURIFICATION AND PROPERTIES OF THE ARGINYL TRANSFER RIBONUCLEIC ACID-PROTEIN TRANSFERASE FROM RABBIT LIVER CYTOPLASM. *(E.)* Soffer, R. L. (Albert Einstein Coll. Med., New York, N. Y.). *J Biol Chem* 245(4):731-737, 1970.

2302 SPECIFIC ACTIVITIES OF URIDINE PHOSPHORYLASE AND URIDINE KINASE IN EHRLICH ASCITES CARCINOMA CELLS AND 6-AZURACIL- AND 6-AZAURADINE-TREATED SUBLINES IN SUCCESSIVE TRANSPLANT GENERATIONS. *(E.)* Blair, D. G. R. (Natl. Cancer Inst. Canada, U. Saskatchewan, Saskatoon) and A. D. Hall. *Brit J Cancer* 23(4):875-890, 1969.

2303 ATTEMPTED ISOLATION OF A HEPARIN PROTEOGLYCAN FROM BOVINE LIVER CAPSULE. *(E.)* Lindahl, U. (Inst. Med. Chem., U. Uppsala, Sweden). *Biochem J* 116(1):27-34, 1970.

2304 CHANGES IN THE VASCULAR STRUCTURE OF THE LIVER FOLLOWING SUBTOTAL HEPATECTOMY IN THE RAT. *(E.)* Ungvary, G. (U. Med. Sch., Budapest, Hungary), J. Demeter, A. Hudak and J. Tari. *Acta Morph Acad Sci Hung* 17(2):143-155, 1969.

2305 INHIBITION BY α-AMANITIN OF RIBONUCLEIC ACID POLYMERASE SOLUBILIZED FROM RAT LIVER NUCLEI. *(E.)* Novello, F. (Inst. Gen. Path., U. Bologna, Italy), L. Fiume and F. Stirpe. *Biochem J* 116(2):177-180, 1970.

2306 RELATIONS OF REACTIVITY TO STRUCTURE IN PANCREATIC RIBONUCLEASE: I. AN ANALYSIS OF THE VARIOUS REACTIONS WITH BROMOACETATE IN THE pH RANGE 2-7. *(E.)* Goren, H. J. (Dept. Biochem. Biochem. Pharmacol., St. U. New York, Buffalo) and E. A. Barnard. *Biochemistry* 9(4):959-973, 1970.

2307 RELATIONS OF REACTIVITY TO STRUCTURE IN PANCREATIC RIBONUCLEASE: II. POSITIONS OF RESIDUES ALKYLATED IN CERTAIN CONDITIONS BY BROMOACETATE. *(E.)* Goren, H. J. (Dept. Biochem. Biochem. Pharmacol., St. U. New York, Buffalo) and E. A. Barnard. *Biochemistry* 9(4):974-983, 1970.

2308 GLUTAMATE DEHYDROGENASE OF NUCLEAR AND EXTRA-NUCLEAR COMPARTMENTS OF CHANG'S LIVER CELLS. *(E.)* Di Prisco, G. (Albert Einstein Coll. Med., Yeshiva U., New York, N. Y.) and H. J. Strecker. *Europ J Biochem* 12(3):483-489, 1970.

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2310 STUDIES ON THE RECONSTITUTION OF RAT LIVER RIBOSOMES FROM DIFFERENT TYPES OF CORE PARTICLES AND SPLIT PROTEINS. *(E.)* Grummt, F. (Inst. Cell Physiol., German Acad. Sci., Berlin) and H. Bielka. *Acta Biol Med German* 23(6):937-940, 1969.

2311 NONIMMUNOLOGIC PRECIPITIN LINES BETWEEN SERUM AND ENTERIC CONTENTS GIVING FALSE POSITIVE EVIDENCE OF LOCAL ANTIBODY PRODUCTION. *(E.)* Kraft, S. C. (Dept. Med., U. Chicago, Ill.), R. M. Rothberg and G. W. Kriebel, Jr. *J Immunol* 104(2):528-529, 1970.

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2313 EFFECTS OF ACTINOMYCIN D ON THE SYNTHESIS OF POLYDISPERSE, RAPIDLY LABELED, NUCLEOPLASMIC RNA IN RAT LIVER. *(E.)* Brossard, M. (U. Quebec, Montreal, Canada) and L. Nicole. *Life Sci* 9(3):129-135, 1970.

2314 RIBOSOMAL PATTERNS FROM FETAL AND NEWBORN RAT LIVER. *(E.)* Litwack, G. (Temple U. Sch. Med., Philadelphia, Pa.) and F. J. Ballard. *Biochem Med* 3(2):158-163, 1969.

2315 RAT HEPATOCYTE PEROXISOMES: ULTRASTRUCTURAL ALTERATIONS FOLLOWING CESSATION OF CHRONIC DIETARY CLOFIBRATE ADMINISTRATION. *(E.)* Hartman, H. A. (Sandoz Pharmaceut., Hanover, N. J.) and A. J. Tousimis. *Experientia* 25(12):1248-1249, 1969.

2316 THE PRIMARY STRUCTURE OF PORCINE PANCREATIC RIBONUCLEASE: THE DISULFIDE BONDS. *(E.)* Phelan, J. J. (Dept. Biochem., U. California, Berkeley) and C. H. W. Hirs. *J Biol Chem* 245(3):654-661, 1970.

2317 HISTOCHEMISTRY AND FLUORESCENCE OF 5-HT CONTENT IN THE MUCOSA OF HUMAN COLON. *It.)* Capurso, L. (2nd Med. Clin., U. Rome, Italy), C. A. Friedmann, L. Onori, P. Paoluzi and C. C. Cassano. *Arch Ital Mal Appar Dig* 35(6):613-618, 1969.

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2319 THE GRANULAR ENDOPLASMATIC NETWORK, POLYSOMES AND RIBOSOMES IN THE LIVER AFTER ACTINOMYCIN ADMINISTRATION. *(Ger.)* David, H. (Path. Inst., Humboldt U., Berlin, Germany). *Verh Anat Ges* 125:223-227, 1969.

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2321 FATTY ACID SYNTHESIS IN RAT LIVER: RELATIVE CONTRIBUTIONS OF THE MITOCHONDRIAL, MICROSOMAL AND NON-PARTICULATE SYSTEMS. *(E.)* Donaldson, W. E. (North Carolina St. U., Raleigh), E. M. Wit-Peeters and H. R. Scholte. *Biochim Biophys Acta* 202(1):35-42, 1970.

2322 THE MODIFICATION OF LABELED CYTIDINE AND THYMIDINE INCORPORATION INTO MITOCHONDRIAL AND NUCLEAR DNA IN NORMAL LIVER HEPATOMA 3924A AND ITS HOST LIVER BY ISOPROTERENOL. *(E.)* Chang, L. O. (U. Virginia Sch. Med., Charlotteville), H. P. Morris and W. B. Looney. *Brit J Cancer* 23(4):868-874, 1969.

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2324 THE STRUCTURE OF THE INTESTINE OF THE HEDGEHOG IN HIBERNATING AND WAKING STATES AND IN THE DIFFERENT STAGES OF AROUSAL: II. ELECTRON MICROSCOPIC OBSERVATIONS. *(It.)* Borghi, M.B.C. (Inst. Histol. Embroyol., U. Firenze, Italy). *Arch Ital Anat Embriol* 74(3):217-239, 1969.

- P:Absorp (2351)
- P:Secr:Panc (2361)
- P:Secr:Stom (2372)
- P:Secr:Hepatobil (2394)(2401)(2412)(2415)(2421)(2426)(2442)(2444)(2445)(2447)(2462)(2463)(2468)
- P:Secr:Int (2470)
- P:Gen (2497)
- Diagproc (2535)(2536)
- D:Esoph (2549)
- D:Stomduo (2582)(2597)(2602)
- D:Stomduo:Peptulc (2633)(2635)
- D:S.Intest:Malabs (2685)
- D:Pancreas (2769)(2770)(2780)
- D:Livbil (2799)(2801)(2815)(2817)(2821)(2830)
- D:Livbil:A.Nonv.Hep (2857)(2858)(2859)
- D:Livbil:A.V.Hep (2868)(2870)(2875)
- D:Livbil:Cirrh (2892)(2893)
- D:Livbil:Gallb (2917)(2940)
- D:Gen (2943)(2947)

2325 D-ARABINOSE INFLUX ACROSS THE BRUSH BORDER OF RABBIT ILEUM. (*E.*)

Schultz, S. G. (U. Pittsburgh Sch. Med., Pa.) and L. Yu-Tu. *Biochim Biophys Acta* 196(2):351-353, 1970.

The kinetics of D-arabinose influx across the brush border of the rabbit ileum was studied after brief exposure of the mucosal surface to a mucosal solution containing ^{14}C-D-arabinose and ^{3}H-inulin followed by calculation of ^{14}C content of the tissue after correction for [^{3}H] inulin space. Influx of D-arabinose was directly proportional to concentration over a range of 0 to 300 mM and there was no tendency towards saturation. D-arabinose influx in the presence of Na$^+$ did not differ significantly from that in the presence of mannitol and D-arabinose influx from a solution containing 125 mM NaCl was not affected by the presence of 25 mM glucose or 1 mM phlorizin in the mucosal solution. There was no evidence for the involvement of a carrier mechanism in the transport of D-arabinose across the brush border of the rabbit ileum and influx appeared to be predominately the result of simple diffusion with a permeability coefficient at of 0.04 cm/hr.

2326 ABSORPTION OF MEDIUM CHAIN TRIGLYCERIDE IN THE LOW BIRTH WEIGHT INFANT AND EVALUATION OF MCT MILK FORMULA FOR LOW BIRTH WEIGHT INFANT NUTRITION USING THE LATIN SQUARE TECHNIQUE.

(*E.*) Yamashita, F. (Kurume U. Sch. Med., Japan), S. Shibuya, I. Funatsu, T. Kuno and H. Ide. *Kurume Med J* 16(4):191-201, 1969.

The fat absorption rate of four (two medium chain triglyceride, two long chain triglyceride) milk formulas (isocaloric, high-protein, low-fat) was studied by the latin square method in 8 low birth weight infants. The rate of fat absorption was calculated on the basis of the fat content in feces in 3 days/ fat content in the milk formula in 3 days x 100%. The absorption rate of fat and weight gain were greater in infants receiving medium chain triglyceride milk formulas than in those receiving long chain triglyceride milk formulas. Infants receiving medium chain triglyceride milk formulas excreted smaller amounts of feces and had a higher incidence of loose stool. There were no differences in stool frequency and incidence of vomiting.

2327 STUDIES ON FATTY ACID ESTERS OF PYRIDOXINE: VI. EFFECTS OF SURFACT ACTIVE AGENTS ON THE GASTROINTESTINAL ABSORPTION OF PYRIDOXINE 3,4-DIPALMITATE IN MAN. (*E.*)

Mizuno, N. (Fac. Pharm. Sci. Osaka U., Japan), A. Kamada, N. Yata and M. Aoki. *Chem Pharm Bull* 17(12):2475-2483, 1969.

The effect of nonionic surfactants (Tween 80, sodium lauryl sulfate and bis[2-ethylhexyl] sulfosuccinate) on the intestinal absorption of pyridoxine 3,4-dipalmitate was studied in 2 normal male subjects by fluorophotometry of urinary excretion products. Intestinal absorption was greater when pyridoxine 3,4-dipalmitate was previously solubilized with aqueous Tween 80 rather than suspended in aqueous Tween 80 or water. The hydrolysis of pyridoxine 3,4-dipalmitate (solubilized in aqueous Tween 80) by either lipase or homogenate of mouse intestine was increased (10 times) by the addition of sodium taurocholate or glycocholate to the incubation medium but was not affected by the addition of sodium lauryl sulfate or bis[2-ethylhexyl)sulfosuccinate]. The permeation of Tween 80 solubilized pyridoxine 3,4-dipalmitate through an everted rat intestinal sac was increased by the addition of lipase or sodium taurocholate. Data emphasize the importance of bile salts for the absorption of drugs with ester linkages.

2328 DRUG TRANSPORT: II. THE EFFECT OF VARIOUS CATIONS ON THE PASSIVE TRANSFER OF DRUGS ACROSS THE EVERTED RAT INTESTINE. (*E.*)

Mayersohn, M. (Sch. Pharm., St. U. New York, Buffalo) and M. Gibaldi. *Biochim Biophys Acta* 196(2):296-304, 1970.

The effects of the presence of Na$^+$ (control), K$^+$, Tris$^+$, Li$^+$, NH$_4^+$ or guanidine$^+$ in a Krebs bicarbonate buffer solution on the passive transfer of water-soluble drugs across the everted rat intestine and on fluid uptake were studied. There was significant decrease in the total amount of drugs transferred when Na$^+$ was replaced by K$^+$ in the buffer solution. The addition of 1 mM ouabain (an inhibitor of Na$^+$ transport) to the Na$^+$ control buffer did not affect the transfer of riboflavin, salicylate and sulfanilamide across the everted intestine. NH$_4^+$, K$^+$ and guanidine$^+$ but not Tris$^+$ reduced the transfer of riboflavin, NH$_4^+$ and K$^+$ reduced the transfer of salicylate and Li$^+$ and K$^+$ completely inhibited the transfer of sulfanilamide. Tissue fluid uptake by everted rat intestine was decreased by presence of cations in the buffer solution in the following order of potency: K$^+$ >NH$_4^+$ >Li$^+$ >Na$^+$ control >guanidine$^+$ > Tris$^+$. The reduction of riboflavin transfer by NH$_4^+$, K$^+$ and guanidine$^+$ was positively correlated with the degree of tissue uptake by intestinal tissue.

2329 THE EFFECT OF ACHYLIA GASTRICA IN RATS ON THE ABSORPTION OF DIETARY IRON. (*E.*)

Murray, J. (Dept. Med., U. Minnesota, Minneapolis) and N. Stein. *Proc Soc Exp Biol Med* 133(1):183-184, 1970.

Iron assimilation was studied in rats with achylia gastrica (induced by x-irradiation) fed a normal diet (containing 275 μg of iron), in normal rats fed a iron-deficient diet and in normal rats fed a normal diet. Weight gain was similar in the first 2 groups but was significantly less than that in the third group of rats. The mean hemoglobin levels fell in the first 2 groups reaching a low of 7.1 g/100 ml in the gastric achylia group 33 days after X-ray irradiation, and 8.8 g/100 ml in the low iron-fed rats 22 days after beginning the diet. Thereafter, the hemoglobin levels rose slowly so that at the end of the study they were 13.0 g/100 ml in the achylia gastrica group, 13.8 g/100 ml in the low iron-fed group and 15.3 in the normal group maintained on a normal diet. The pH of the gastric juice from rats with achylia gastrica (7.3) was much higher than that from nonirradiated rats (1.61

for the low iron-fed group and 1.28 for the normal group). The mean concentrations and the mean total amounts of nonheme iron in the livers of the rats with achylia gastrica and the low-iron fed rats were significantly less than that for the normal rats fed a normal diet.

2330 INJURY-STIMULATED UPTAKE OF α-AMINOISOBUTYRIC ACID BY RAT LIVER. *(E.)* Shihabi, Z. (U. South Dakota Sch. Med., Vermillion), H. F. Balegno and O. W. Neuhaus. *Biochem Biophys Res Commun* 38(4):692-696, 1970.

The effect of injury (simulated by sham operation, adrenalectomy, and hormone replacement therapy) on hepatic uptake of α-aminoisobutyric acid (AIB) was measured by scintillation counts in the minced liver of male Sprague-Dawley rats (160 to 200 gm). AIB is not metabolized and its accumulation in the cell is an index of changes in cell permeability and in the active transport mechanism. Rats were injected (i.v.) with 1.0 μC /100 gm of body weight of ^{14}C-AIB, and 60 min later were decapitated and livers were perfused with saline, removed and minced in cold Tris buffer (pH 7.5). An aliquot (0.1 ml) was combined with 5 ml of scintillation mixture and counted in a liquid scintillation counter. AIB uptake in the injured rat livers was linear and was stimulated to levels between 2- and 4-fold greater than linear uptake in normal rat livers. Adrenalectomy resulted in a modified stimulation of uptake which reached a maximum 48 hr post injury, as compared to 4 to 8 hr required by normal livers to reach a maximum. Chronic adrenalectomized rats were hypersensitive to the stimulus of reinjury and to injections of epinephrine or hydrocortisone. The response to injury leading to an elevated synthesis of plasma proteins appears to involve an early increased permeability of liver cells to amino acids.

2331 INTESTINAL MALABSORPTION INDUCED BY ORAL COLCHICINE: COMPARISON WITH NEOMYCIN AND CATHARTIC AGENTS. *(E.)* Race, T. F. (St. U. New York, Upstate Med. Ctr., Syracuse, N. Y.), I. C. Paes and W. W. Faloon. *Amer J Med Sci* 259(1):32-41, 1970.

Intestinal absorption, mucosal enzyme activity and mucosal histology were studied in 11 obese, otherwise healthy subjects receiving colchicine (p.o., 1.9-3.9 mg/day). Colchicine produced widespread alteration of absorptive functions as demonstrated by increased fecal loss of sodium, potassium, fat and nitrogen, by decreased d-xylose and vitamin B$_{12}$ absorption, and by decreased serum cholesterol and carotene concentration. Comparison of the fecal excretory pattern with oral neomycin or magnesium sulfate revealed greater fecal loss of fat with neomycin than with colchicine while magnesium sulfate produced only slightly increased fecal fat excretion. Mucosal enzyme activity was decreased following colchicine administration (sucrase activity decreased from 6-75%, maltase activity from 6-62% and lactase activity from 34-84%). No sugar was found in freshly passed stools during colchicine administration. Histologic changes were variable, usually mild and appeared to be unrelated to colchicine dosage. Colchicine appears to produce a reversible malabsorption syndrome in man which is related to disruption of intestinal mucosal function.

2332 MOVEMENTS OF CALCIUM DURING TENSION DEVELOPMENT INDUCED BY BARIUM AND HIGH-POTASSIUM IN GUINEA PIG TAENIA COLI. *(E.)* Karaki, H. (Fac. Agric. U. Tokyo, Japan), M. Ikeda and N. Urakawa. *Jap J Pharmacol* 19(2):291-299, 1969.

Changes in the uptake and efflux of ^{45}Ca and total Ca content of smooth muscle of guinea pig taenia coli were measured during Ba and high-K induced tension development. ^{45}Ca uptake increased 5 minutes after the addition of 0.5 mM Ba but 17 to 20 minutes later, both uptake and efflux of ^{45}Ca decreased. Total Ca content of the tissue did not change during the process but ^{45}Ca which remained after 4 minutes wash following incubation increased. Similar results were obtained with 20 mM Ba. In the presence of hypertonic 40 mM K, ^{45}Ca uptake and tissue Ca did not change during the first 5 minutes, but 10 to 30 minutes later both increased. ^{45}Ca efflux was not altered through the process. The early phase of Ba induced tension development appears to be the result of the increased Ca exchangeability, although the participation of the process of Ca release from a cellular site cannot be overlooked. The late phase is related to the process of firmly binding Ca and/or to the Ca already firmly bound at a cellular site. On the other hand, the early (phasic) phase of high-K induced tension development is the result of the release of Ca from a cellular site and the late (tonic) phase is related to the transmembrane Ca transport especially towards the tightly bound fraction of the tissue.

2333 PALMITATE ABSORPTION BY MITOCHONDRIA AND MICROSOMES OF LIVER AND BROWN ADIPOSE TISSUE DURING DEVELOPMENT. *(E.)* Erazimova, J. (Inst. Physiol., Czechoslovak Acad. Sci., Prague) and Z. Drahota. *Physiol Bohemslov* 18(2):113-117, 1969.

The affinity of mitochondria and microsomes in rat liver and brown adipose tissue to palmitate were measured at 0°C. The homogenate was mixed with the serum albumin-^{14}C-palmitate complex, mitochondria and microsomes were isolated, and the n-moles of palmitate per mg. protein were determined. In mitochondria of both tissues the affinity for palmitate decreases after birth. The affinity of liver mitochondria diminishes from 4.1 n-moles of palmitate per mg. protein in fetuses, to 2.6 in 1 day old, and to 1.3 in adult rats. On the other hand, the affinity of mitochondria in brown adipose tissue decreases from 5.9 n-moles of palmitate per mg. protein in fetuses, to 2.4 in 1 day old rats and then increases to 3.1 in 10 day old rats and to 3.6 in 30 day old animals. During the suckling period, the affinity values of liver mitochondria approach those of the mitochondria in brown adipose tissue, but in 30 day old animals, the affinity of mitochondria in the brown adipose tissue is twice that of the liver mitochondria. Microsomes exhibited greater affinity to palmitate during postnatal development than mitochondria, while the reverse was true in fetuses.

2334 EFFECT OF GASTRIC JUICE ON THE ABSORPTION OF WATER AND CHLORIDE IN THE ILEUM. (*E.*)

Hochman, R. (St. U. New York, Downstate Med. Ctr., Brooklyn, N. Y.), P. K. Kottmeier, R. Adamsons and C. Dennis. *Amer J Surg* 119(1):64-66, 1970.

Thiry-Vella loops were constructed in the terminal ileum of control and experimental dogs to determine the effect of gastric juice on the absorption of chloride and water. Gastric juice was obtained from 2 adult mongrel dogs with indwelling cannulas in isolated gastric pouches. The exposure of iliac mucosa to gastric juice with a pH <3 not only decreased water absorption but also led to an influx of water without evidence of recovery at 60 min. Although gastric juice with a pH of 4 to 5 showed a tendency to reduce water absorption at 30 min, it was statistically insignificant and equal to the baseline values at 60 min. At 30 and 60 min after the application of gastric juice (pH 1 to 2) to the terminal ileum, the volume of chloride in the Thiry-Vella loops increased. After exposure to gastric juice (pH 2 to 3) a similar effect was seen at 30 min and a leveling off at 60 min. Gastric juice with a pH of 4 to 5 had no statistically significant effect on iliac chloride absorption.

2335 EXCRETION OF STEROID HORMONES IN ADULTS: C_{19} AND C_{21} STEROIDS IN FECES FROM PREGNANT WOMEN. (*E.*)

Eriksson, H. (Karolinska Inst., Stockholm, Sweden), J. A. Gustafsson and J. Sjovall. *Europ J Biochem* 12(3):520-526, 1970.

Excretion of C_{19} and C_{21} steroids in feces of pregnant women was investigated by gas chromatography-mass spectrometry. Over 90% of steroids identified were unconjugated and had the following general structures: androstane-3,17-diol, 3-hydroxy-17β-pregnan-20-one, 3-hydroxy-17α-pregnan-20-one, 3β-hydroxy-5-pregnen-20-one, pregnane-3,20-diol, 3,16α-dihydroxypregnan-20-one, 5β-pregnane-3α,17α,20α-triol, pregnane-3,16α,20-triol, and 5α-pregnane-3,20α,21-triol. The $C_{21}O_2$ steroid isomers in the monosulphate and "diconjugate" fractions had the 5α configuration, whereas both 5α and 5β isomers were present in the free steroid fraction. The major part of the 5α-steroids carried a 3β-hydroxyl group, whereas the predominant 5β-steroids had a 3α-hydroxyl group. The amounts of steroids in a pooled sample of feces from a nine-month pregnant woman corresponded to a daily excretion of 33 mg. Data has shown that fecal excretion is an important route for elimination of several steroids during pregnancy. Steroids excreted in the bile seemingly are modified by hydrolase, oxido-reductase and dehydroxylase activities of the upper intestinal microorganisms.

2336 STUDY OF THE INTESTINAL ABSORPTION OF ^{51}Cr-LABELED INTRINSIC FACTOR. (*E.*)

Yamaguchi, N. (New York Med. Coll., New York), W. S. Rosenthal and G. B. J. Glass. *Amer J Clin Nutr* 23(2):156-164, 1970.

Intrinsic factor from human and hog sources was partially purified by ion-exchange column chromatography and gel filtration and labeled by incubation with $^{51}\mathrm{CrCl}_3$ to evaluate the possibility that intrinsic factor is absorbed from the gastrointestinal tract. The labeled intrinsic factor preparations were administered, (bound either to radioactive or nonradioactive vitamin B_{12}) to four normal volunteers and seven individuals with absent or deficient intrinsic factor secretion. Study of the absorption of both labels by radioactivity measurements of urine, feces, and plasma, as well as hepatic surface scintillation counting, and, in the case of 3 normal subjects, whole-body counting, demonstrated no significant absorption of the ^{51}Cr label. There was evidence, however, of absorption of radioactive vitamin B_{12}, which further substantiated the intrinsic factor activity of the labeled preparation. These data do not support the contention that the intrinsic factor molecule enters the circulation from the intestine in the process of vitamin B_{12} absorption in an intact state.

2337 LACTOSE ABSORPTION IN GROWTH RETARDED NEWBORN INFANTS. (*E.*)

Fekete, M. (U. Med. Sch., Pecs, Hungary), I. Galfi, Gy. Soltesz and J. Mestyan. *Actra Paediat Acad Sci Hung* 10(3-4):303-313, 1969.

Lactose and glucose/galactose tolerance tests were performed in normal full-term, premature and growth-retarded full-term newborn infants. Blood glucose levels obtained during the lactose tolerance tests in growth retarded and premature infants showed greater variations than those observed in normal full-term infants. While 5 of the 9 premature infants had an absorption ratio less than 50, lactose absorption appeared to be impaired in only 4 of the growth-retarded full-term infants. All non-absorber growth-retarded full-term infants were fetally malnourished and none of the normally grown mature infants showed an impairment of lactose absorption. Lactose malabsorption occurred only in infants severely underweight for their gestational age. The average birth weight and absorption ratio of the 4 non-absorber growth retarded full-term infants was 1320 g and 24, resp. In these infants pregnancy was complicated with severe toxemia and in 3 of them the placenta was extensively infarcted. Only in normal full-term newborns weighing less than 1500 g was there a striking difference in the maximum increment of blood glucose following the ingestion of lactose and glucose plus galactose. There was no decrease in th pH of the stools of the nonabsorber growth-retarded full-term infants following the lactose tolerance test.

2338 THE UPTAKE AND RELEASE OF BILE SALT AND FATTY ACID BY HAMSTER JEJUNUM. (*E.*)

Mishkin, S. (Roy. Victoria Hosp., Montreal, Canada) and J. I. Kessler. *Biochim Biophys Acta* 202(1):222-224, 1970.

Everted hamster jejunal gut sacs were incubated for 10 min in a micellar solution containing 10 μmoles [^{14}C]palmitic acid, monoolein, [^{3}H]taurodeoxycholate and then rinsed in either an unlabeled micelle solu-

ion or Krebs-Ringer phosphate solution. The net
otake (amount of absorbed micelle minus total bile
alt uptake) of [^{3}H]taurodeoxycholate and [^{14}C]-
almitic acid was 612.1 ± 20.4 μmole/100 mg and
5.2 ± 3.4 μmole/100 mg, resp. A significant per-
entage of the net uptake of both [^{3}H]taurodeoxychol-
te and [^{14}C]palmitic acid was available for subse-
uent release into unlabeled micelle or Krebs-Ringer
nosphate solutions. The percentage release of [^{3}H]-
aurodeoxycholate exceeded that of [^{14}C]palmitic acid
y 19.7% ± 2.9 and 23.4% ± 0.7 into the unlabeled
icelle and Krebs-Ringer phosphate rinses, resp. The
atio of [^{3}H]taurodeoxycholate to [^{14}C]palmitic acid
n these rinses was markedly in excess of the origi-
al 10 to 1 ratio in the micellar incubation medium.
ata support the hypothesis that the initial step in
ne absorption of conjugated bile salt and fatty acid
rom micellar solution is energy-dependent and in-
olves the reversible binding of these anionic mole-
ules to a family of receptors presumably located
ear the surface of the epithelial cell.

339 UPTAKE AND TRANSPORT OF VITAMIN B$_{12}$ IN SUBCELLULAR FRACTIONS OF INTESTINAL MUCOSA.

E.) Rosenthal, H. L. (Washington U. Sch. Dent.,
t. Louis, Mo.), L. Cutler and W. Sobieszczanska.
ner J Physiol 218(2):358-362, 1970.

ntestinal mucosa from male guinea pigs, following
avage of cyanocobalamin-^{57}Co, was fractionated
ith 0.25 M sucrose containing 0.002 M CaCl$_2$.
adioactivity of the whole homogenate and cell-debris
raction increased rapidly and reached maximum
alues at 1.5 hr postdosage, declining gradually
uring the remaining 12-hr experimental period.
eak values occurred at 1.5 hr after a definite lag
eriod in the mitochondrial and microsomal fractions
nd then declined rapidly thereafter. Very little
adioactivity was contained in the cytosol during
arly absorption but reached peak values 4 hr after
osage followed by the usual decline. During ab-
orption the vitamin was tightly bound to the formed
ellular elements and serum but was readily removed
rom the cytosol by exhaustive dialysis. It appears
hat vitamin B$_{12}$ is first transported across the cell
embrane to subcellular particles where a vitamin B$_{12}$
erivative is formed. The derivative is then released
o the cell sap in a dialyzable form for transport to
he circulatory system where it occurs in a tightly
ound form.

340 INTESTINAL ABSORPTION OF GLUCOSE AND HISTIDINE ISOMERS BY FED AND SEMISTARVED MICE.

E.) Madge, D. S. (Dept. Biol. Sci., Wye Coll., U.
ondon, Kent, England). *Comp Biochem Physiol* 32(1):
-6, 1970.

bsorption of glucose and histidine isomers by the
small intestine was studied in fed and semistarved
(7-day restricted diet) young adult mice. Serosal
transport of D-glucose and L-histidine was greater
in semistarved than in fed mice, while L-glucose
and D-histidine were unabsorbed with both groups of
mice. Phlorrhizin and 2:4-dinitrophenol inhibited
absorption of glucose and histidine isomers, re-
spectively. There was little serosal fluid transfer in semistarved compared with fed intestine and the rate of D-glucose metabolism of semistarved intestine was more than three times higher than in the fed intestine while the rate of L-histidine accumulation apparently remained unchanged. Slight, generalized atrophy of various regions of semistarved intestine was observed. The greater serosal transfer of D-glucose in semistarved intestine indicates a possible relationship to augmented intestinal D-glucose metabolism.

2341 BICARBONATE SECRETION AND NON-Na COMPONENT OF THE SHORT-CIRCUIT CURRENT IN THE ISOLATED COLONIC MUCOSA OF *BUFO ARENARUM*. (*E.*)

Carlisky, N. J. (Fac. Pharm. Biochem., U. Buenos Aires, Argentina) and V. L. Lew. *J Physiol* 206(3): 529-541, 1970.

In the isolated colonic mucosa of *Bufo arenarum*, there is a variable fraction of the short-circuit current (0 to 38%) that is unaccounted for by either the Na or the Cl and bicarbonate transmembrane net fluxes. There is bicarbonate-CO$_2$ compartment in the epithelial cell layer of the isolated colonic mucosa which is isolated isotopically from bicarbonate-CO$_2$ present in the serosal bathing solution. The bicarbonate ions proceeding from this compartment appear in the mucosal solution and the cell to mucosa bicarbonate flux (efflux) parallels the variations of the non-Na component of the short-circuit current. The transport of the bicarbonate ions (formed within the membrane) to the mucosal solution compartment is detected by a lowering of mucosal specific activity of bicarbonate and the specific activity of bicarbonate was determined in the inside solution (initially bicarbonate-free) of ten normal and four everted colonic sacs incubated in an external medium (reservoir) containing constant specific activity of bicarbonate. Comparison between membrane-to-internal solution bicarbonate flux and non-Na component of the short-circuit current was done by measuring remaining short-circuit current in Na-free medium and by determining simultaneously the Na net flux. In the normal sacs there is a reduction of the specific activity of bicarbonate which accounts for a membrane-to-mucosa bicarbonate flux which parallels the variations of the Non-Na component for the short-circuit current although quantitatively representing only 68 to 87% of it. There was no systematic decrease in the rate of reduction of the mucosal specific activity of bicarbonate in successive flux periods (excluding a slow equilibrium of intracellular with serosal bicarbonate).

2342 EXPERIMENTAL STUDIES OF ABSORPTION OF METHIONINE IN INTESTINAL LOOPS OF DOGS.

(*E.*) Hauge, C. W. (U. Oregon Med. Sch., Portland) and W. W. Krippaehne. *Amer J Surg* 119(1):67-69, 1970.

The absorption of methionine in loops of the ascending colon, descending colon and jejunum was studied in dogs by instilling known amounts of L-methionine at varying concentrations into the (surgically-created) loops. Using colorimetric techniques it was shown that L-methionine was absorbed from both left and right colonic loops with the average absorption during a 30 min perfusion being 22% of a 40 mm solution of L-methionine. Decarboxylation of methionine in both colonic and jejunal loops was observed using L-methionine-C^{14} and preliminary studies confirmed the evidence of absorption of this amino acid from the colon as radioactivity was observed in portal blood, peripheral blood, and urine during perfusion of either small or large bowel loops. The colonic administration of amino acids may have future application for clinical nutrition needs.

2343 NEW MOVEMENTS OF CALCIUM AND MAGNESIUM IN SLICES OF RAT LIVER. *(E.)* Van Rossum, G.D.V. (Temple U. Sch. Med., Philadelphia, Pa.). *J Gen Physiol* 55(1):18-32, 1970.

Rat liver slices incubated at 1°C in 10 mM phospnate or 25 mM bicarbonate plus 2 mM phosphate-buffered Ringer's solutions containing 1.2 mM calcium ion underwent a 3-fold increase in calcium ion content relative to their fat-free solids and lost 10% of their magnesium ion within 10 min. As a result of the simultaneous movements of ions and water, the apparent concentration of calcium ion (total tissue calcium ion/total tissue water) almost doubled, while the apparent magnesium ion concentration was halved (net changes taking place in 90 min were similar in both media). Upon incubation at 38 C in phosphate medium, calcium ion movements became erratic; a larger and more consistent calcium ion extrusion was obtained with bicarbonate. The calcium ion content fell from 13.9 to 8.1 millimoles/kilograms fat-free dry weight by the first sampling time (10 min) and then remained constant. The apparent concentration of calcium ion also fell, from 3.6 to 2.7 millimoles/kilograms water. Succinate (40 mM), which strongly stimulated respiration, caused an accumulation of calcium ion in phosphate-incubated slices. Calcium ion extrusion was prevented by respiratory inhibitors, but not by inhibition of the sodium and potassium ion transport (by ouabain or potassium ion-free medium). Liver slices seemingly can bring about a net extrusion of calcium ion which requires energy from respiration but which is independent of the occurrence of sodium and potassium ion transport or the existence of a concentration gradient of sodium ion between cells and medium.

2344 CHOLESTEROL EXCRETION FOLLOWING CHRONIC ILEAL BYPASS. *(E.)* Schwartz, M. Z. (U. Minnesota Med. Sch., Minneapolis), R. B. Moore and H. Buchwald. *Surgery* 67(2):346-349, 1970.

Cholesterol excretion following chronic ileal bypass was studied in New Zealand rabbits injected i. v. with 10 μc of cholesterol-4-^{14}C. Average 24-hr cholesterol excretion before bypass was 37 mg/day and after bypass was 100 mg/day and the average percent of the total radioactivity coming from the bypassed loop for all 10 rabbits was 1.01% of the total radioactivity excreted per day. The cholesterol specific activity of the bypassed ileal loop contents was found to be the same as the blood specific activity in a given rabbit and cholesterol excretion in the chronically bypassed ileal loop was 5% of that measured in an acutely bypassed ileal loop. The cholesterol specific activity showed that the ileal loop cholesterol was derived from the circulating blood only and that a mechanism of local intestinal *de novo* cholesterol synthesis with undirectional flux secretion into the lumen was not present.

2345 EFFECT OF CONCENTRATION ON THE INTESTINAL ABSORPTION OF *l*-LYSINE IN AGING RATS. *(E.)* Penzes, L. (U. Med., Budapest, Hungary). *Exp Geront* 4(4):223-230, 1969.

2346 THE UPTAKE OF PERTECHNATE BY THE VAGOTOMIZED RAT STOMACH. *(E.)* Eliscu, E. H. (Harvard Med. Sch., Boston, Mass.), M. J. Potsaid and H. H. Lo. *Radiology* 94(3):699-701, 1970.

2347 INHIBITION OF IRON ABSORPTION BY PANCREATIC EXTRACTS. *(E.)* Dietze, F. (1st Med. Clin., Humboldt U., Berlin, Germany) and G. Bruschke. *Lancet* 1(7643):424, 1970.

2348 EFFECTS OF OUABAIN AND DIPHENYLHYDANTOIN ON ELECTROLYTE AND WATER SHIFTS DURING INTESTINAL ABSORPTION IN THE RAT. *(E.)* Van Rees, H. (Dept. Pharmacol., U. Leiden, Netherlands), D. M. Woodbury and E. L. Noach. *Arch Int Pharmacodyn* 182(2):437, 1969.

2349 STUDIES ON MUTAROTASES: VI. ENZYME LEVELS AND SUGAR REABSORPTION IN DEVELOPING RAT KIDNEY AND INTESTINE. *(E.)* Bailey, J. M. (George Washington U. Sch. Med., Washington, D.C.), P. H. Fishman and P. G. Pentchev. *J Biol Chem* 245(3):559-563, 1970.

2350 INFLUENCE OF TAURINE DERIVATIVES ON THE ABSORPTION OF SALICYLIC ACID DERIVATIVES IN RAT GASTROINTESTINAL TRACT. *(Jap.)* Morisaka, K. (Osaka Coll. Pharm., Japan) and Y. Nakamoto. *J Pharm Soc Jap* 89(12):1718-1723, 1969.

2351 TRANSPORT AND DISTRIBUTION OF K$^+$ AND Na$^+$ IONS IN ISOLATED RAT LIVER NUCLEI. *(Rus.)* Antonov, V. F. (N. I. Pirogov Med. Inst., Moscow, USSR) and A. L. Afanasyev. *Biofizika* 14(6):1055-1060, 1969.

2352 STUDY BY RATE OF TRANSIT THROUGH THE INTESTINE BY $Cl_3{}^{51}Cr$ DILUTION CURVE: COMPARISON WITH CARMINE TEST. *(Fr.)* Bernier, J. J. (Hosp. Saint Lazare, Paris, France). *Biol Gastroent* (supp. 2):171-180, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

53 ABSORPTION OF COPPER ^{64} FROM GASTRO-
INTESTINAL TRACT OF THE RAT. *(E.)* Marceau,
(Fac. Med., U. Toronto, Canada), N. Aspin and
Sass-kortsak. *Amer J Physiol* 218(2):377-383, 1970.

54 THE EFFECTS OF CARBON DIOXIDE AND BI-
CARBONATE ON CHLORIDE FLUXES ACROSS FROG
STRIC MUCOSA. *(E.)* Imamura, A. (Kyoto U. Med.,
pan). *Biochem Biophys Acta* 196(2):245-253, 1970.

55 INTESTINAL DRUG ABSORPTION AND METABOLISM
II: KINETIC ASPECTS OF INTESTINAL GLUCURO-
DE CONJUGATION. *(E.)* Barr, W.H. (Sch. Pharm. St.
New York, Buffalo) and S. Riegelman. *J Pharm*
59(2):164-168, 1970.

P:Morph (2324)
P:Secr:Panc (2371)
P:Secr:Int (2473)
D:Stomduo (2583)
D:Stomduo:Peptulc (2655)
D:S.Intest (2657)(2659)(2660)
D:S.Intest:Malabs (2686)
D:Livbil (2825)

2356 ELECTROPHYSIOLOGICAL STUDIES OF THE ANTRUM MUSCLE FIBERS OF THE GUINEA PIG STOMACH.

(E.) Kuriyama, H. (Fac. Med. Dent. Kyushu U., Fukuoka, Japan), T. Osa and H. Tasaki. *J Gen Physiol* 55(1):48-62, 1970.

Measurements using microelectrode techniques of membrane potentials of single smooth muscle fibers excised from various regions of guinea pig stomach showed that they did not differ from those measured in intestinal muscle. Spontaneous slow waves with superimposed spikes were recorded from the longitudinal and circular muscle of the antrum. The development of tension was preceded by spikes but often tension appeared only when the slow waves were generated. Contracture in high K+ solution developed at a critical membrane potential of -42 mv. $MnCl_2$ blocked the spike generation, then lowered the amplitude of the slow wave. Withdrawal of Na^+, or addition of atropine and tetrodotoxin, inhibited the generation of most of the slow waves but a spike could still be elicited by electrical stimulation. Prostigmine enhanced and prolonged the slow wave and acetylcholine depolarized the membrane without change in the frequency of the slow waves. Chronaxie for the spike generation in the longitudinal muscle of the antrum was 30 msec and conduction velocity was 1.2 cm/sec. the time constant of the foot of the propogated spike was 28 msec. The space constants measured from the longitudinal and circular muscles of the antrum were 1.1 mm and 1.4 mm, resp.

2357 INFLUENCE OF BOLUS TEMPERATURE ON HUMAN ESOPHAGEAL MOTOR FUNCTION.

(E.) Winship, D. H. (Milwaukee County Gen. Hosp., Wisc.), S. R. Viegas de Andrade and F. F. Sboralske. *J Clin Invest* 49(2):243-250, 1970.

The effects of water swallowing (hot, cold and room temperature) on esophageal motor function were compared in 11 normal young men. Cold water slowed or abolished esophageal peristalsis, prolonged the contraction wave in the distal esophagus, produced a delayed but prolonged relaxation of the lower esophageal sphincter, and regularly caused lower esophageal sphincteric contraction of increased amplitude. Cold water did not decrease the response frequency of the lower esophageal sphincter even with peristaltic wave abolition. Hot water accelerated esophageal responses to swallowing and the acceleration was characterized by increased speed of wave propagation, shorter duration waves, a more brief relaxation of the lower esophageal sphincter, and lower esophageal contraction of less amplitude. Neither extreme of temperature (hot vs cold) altered the rapid passage of water swallows through the more proximal esophageal portions. Hot water traversed the lower esophageal sphincter more rapidly than did room temperature water, while cold water (often delayed in entering the stomach) tended to pool in the distal esophagus even though sphincteric relaxation was manometrically complete and prolonged. Changes in esophageal motor function seemingly are secondary to changes in smooth muscle contractility in response to temperature variation.

2358 ELECTROTONIC SPREAD OF SLOW WAVES IN CIRCULAR MUSCLE OF SMALL INTESTINE.

(E.) Bortoff, A. (Upstate Med. Ctr., Syracuse, N. Y.) and F. Sachs. *Amer J Physiol* 218(2):576-581, 1970.

The electrotonic spread of slow waves in the circular muscle was studied in both flat and cylindrical jejunal preparations of adult cats and rabbits. Records obtained from flat preparations of intact longitudinal muscle showed slow waves with a triphasic (positive-negative-positive) deflection which gradually returned to initial potential after 3 to 4 sec. Circular muscle records were all monophasic (positive) and resembled monophasic records obtained frome volume-conducted slow wave of longitudinal muscle. The slow wave in circular muscle was entirely passive (with current being generated by active depolarization of longitudinal muscle), and was electrotonic. Both circular and longitudinal muscle layers depolarize simultaneously (due to electrotonic spread into circular muscles), causing spike discharge and consequent contraction of the two layers to occur synchronously (this actively was demonstrated both in cat and rabbit jejuni).

2359 RADIOLOGICAL STUDIES ON EMPTYING OF HUMAN GALLBLADDER.

(E.) Park, C. Y. (Yonsei U. Coll. Med., Seoul, Korea), Y. S. Pae and S. S. Hong. *Ann Surg* 171(2):294-299, 1970.

A quantitative X-ray method (based on the calculated volume of the radiopaque gallbladder (Simpson's Method)) was used to study gallbladder emptying stimulated by either cholecystokinin (i.v.) or a fat meal (eggs and milk) in 96 Korean healthy subjects and patients with gastrointestinal disease. Gallbladder evacuation was more rapid following i.v. administration of cholecystokinin (1 μ/kg) than after a fat meal. After a fat meal, the gallbladder contracted to 55.1% of its size in 15 min and to 20.8% in 60 min while after cholecystokinin, the gallbladder contracted to 23.4% in 15 min and to 21.4% of its initial size in 30 min. The emptying of the gallbladder in response to a fat meal was delayed for up to 30 min by prior administration of morphine, hexamethonium or atropine (0.1, 1.0 and 0.01 mg/kg, resp., i.m.) and the initial rapid phase of emptying was abolished by morphine, but was only slightly decreased by atropine or hexamethonium. The gallbladder mean volume at 12 hr after Telepaque administration (3 g p.o.) was 23.0 ± 4.2 ml (14 subjects), and was increased to 29.9 ± 3.9 ml three hr after Cholografin administration (i.v.).

2360 STUDIES OF CHOLINERGIC INHIBITION USING THE GUINEA-PIG ILEUM.

(E.) Chiou, C.Y. (U. Florida Coll. Med., Gainesville) and J.P. Long. *Arch Int Pharmacodyn* 182(2):269-278, 1969.

- Diagproc (2538)
- D:Esoph (2544)(2548)(2554)
- D:Stomduo (2587)
- D:Livbil:Gallb (2918)
- D:Gen:Parasit (3003)

1   AMINO-ACID SEQUENCE OF PORCINE
       PANCREATIC ELASTASE AND ITS HOMOLOGIES
H OTHER SERINE PROTEINS. *(E.)* Shotton, D.M.
 Postgrad. Med. Sch., Cambridge, England) and
S. Hartley. *Nature* 225(5235):802-806, 1970.

 structure of porcine elastase was determined
enzymatic digestion and chemical sequence
lysis and was shown to be related to chymo-
psins A and B and trypsin. The specificity of
stase for substrates with uncharged non-aromatic
e-chains is due to the differences in side-
ins of trypsin and chymotrypsins with specifi-
y for basic and aromatic side-chain substrates,
pectively. Elastase consists of a single poly-
tide chain of 240 residues with a molecular
ght of 25,900 which is homologous with the
gle chain of trypsin and the B and C chains of
 chymotrypsins. In common with all serine
teinases, elastase has a serine residue at the
ive center of the chain.

2   RESULTS OF EXPERIMENTAL TRANSPLANTATION
       OF THE PANCREAS. *(Pol.)* Jedrzejewski, R.
ad. Med., Warsaw, Poland), J. Ladygin, K.
zewski and J. Nielubowicz. *Pol Prezgl Chir*
11):1509-1514, 1969.

3   INFLUENCE OF THE DIET ON THE FUNCTION AND
       MORPHOLOGY OF THE PANCREAS: VII. INFLU-
E OF HUNGER ON THE SECRETION OF BICARBONATES,
IUM AND POTASSIUM IN THE PANCREATIC JUICE OF VOL-
EER SUBJECTS. *(Cz.)* Bucko, A. (Natl. Nutrit. Res.
t., Bratislava, Czechoslovakia), M. Ovecka, Z.
ec and J. Grunt. *Cesk Gastroent Vyz*
7):329-335, 1969.

54   PANCREATIC ELASTASE SECRETION IN MAN.
       (Ger.) Schoenemann, J. (Med. Clin., U.
tock, Germany). *Z Ges Inn Med* 24(21):742-746,
9.

55   CHEMICALLY DEFINED MEDIUM FOR ORGAN CUL-
       TURE DIFFERENTIATION OF RAT PANCREAS AN-
E. *(E.)* Parsa, I. (St. U. New York, Downstate
. Ctr., Brooklyn), W. H. Marsh and P. J. Fitz-
ald. *Exp Cell Res* 59(1):171-175, 1970.

P:Morph (2272)(2276)(2306)(2307)(2316)(2320)
P:Absorp (2347)
P:Gen (2491)
D:Pancreas:Pancreat (2784)(2792)
D:Livbil:Cirrh (2898)

Stomach

2366 GASTRIC SECRETION IN THE CANINE FETUS FOLLOWING MATERNAL STIMULATION: EXPERIMENTAL STUDIES ON PLACENTAL TRANSFER OF INSULIN, HISTAMINE AND GASTRIN. *(E.)* Bruckner, W. L. (U. California Los Angeles Sch. Med.), H. D. Snow and E. W. Fonkalsrud. *Surgery* 67(2):360-363, 1970.

Gastric secretion was determined in the fetuses of pregnant dogs near term following maternal stimulation with insulin, histamine and gastrin. The average base-line gastric secretion in pups (one week before term) was 0.73 ml after 4 hr and the average gastric pH was 7.06. The average fetal gastric secretion was 1.716 ml following maternal stimulation with insulin, 2.16 ml following maternal stimulation with histamine, and 0.74 ml following maternal stimulation with gastrin. The average fetal gastric pH was 6.0 following maternal stimulation with insulin, 5.92 following maternal stimulation with histamine, and 4.88 following maternal stimulation with gastrin. Potassium content in fetal gastric juice was 3.24 mEq/liter in control fetuses, 3.97 mEq/liter following maternal gastrin stimulation, 8.51 mEq/liter following maternal insulin stimulation, and 11.94 mEq/liter following maternal histamine stimulation. Insulin, gastrin, and histamine apparently are able to cross the placental barrier and stimulate gastric secretion in the fetus.

2367 THE ROLE OF MICROORGANISMS AS A FUNCTION OF NICOTINAMIDE DEAMIDATION IN RAT STOMACH. *(E.)* Tanigawa, Y. (Osaka Med. Coll., Japan), M. Shimoyama, R. Murashima, T. Ito, K. Yamaguchi and I. Ueda. *Biochim Biophys Acta* 201(2):394-397, 1970.

The presence of nicotinamide deamidase activity (measured by the formation of [^{14}C]nicotinic acid from [^{14}C]nicotinamide) in the pars preventricularis and pars glandularis portions of the rat stomach was studied by column chromatography and scintillation counting. Almost all of the nicotinamide deamidase activity (90%) occurred in the pars preventricularis and only minimal activity (10%) occurred in the pars glandularis in normal rats. No nicotinamide deamidase activity occurred in either portion of the stomach in germ-free rats. The deamidation of [^{14}C]-nicotinamide was proportional to the amount of deamidase present in the rat stomach. Nicotinamide deamidase was purified 40- to 50-fold from the rat stomach and its highest activity occurred at pH 6.5. Enzymes present in bacilli isolated from the pars preventricularis and grown in basal medium had all the properties of nicotinamide deamidase. Nicotinamide in the diet may be deaminated by a microorganism present in the stomach and then absorbed in the small intestine to serve as a precursor for pyridine nucleotide biosynthesis via the Preiss-Handler pathway.

2368 EFFECT OF SECRETIN ON HISTAMINE-STIMULATED SECRETION IN THE GASTRIC FISTULA OF THE RAT. *(E.)* Johnson, L. R. (VA Ctr., Los Angeles, Calif.) and D. B. Tumpson. *Proc Soc Exp Biol Med* 133(1):125-127, 1970.

The species-dependent inhibition of histamine-stimulated acid secretion by secretin was studied (4 male Sprague-Dawley rats (275-310 g) were prepared with chronic fistulas) in a crossover design experiment in which 2 rats received histamine alone (5 to 40 mg/kg) or a combination of histamine (20 mg/kg) and secretin (75 units/kg). Gastric secretions were collected for 2.5 hr after injection and compared with pre-injection values. Maximal secretion of HCl output occurred with a dose of 20 mg/kg of histamine, increasing from a resting value of approximately 40 µEq/15 min to nearly 80 µEq/15 min. Doubling the dose of histamine to 40 mg/kg produced a decrease in acid production. Secretin failed to inhibit gastric secretion evoked by a maximal dose of histamine. The response to 20 mg/kg of histamine plus secretin was not statistically different from that of a dose of histamine by itself. In the rat, as in the dog and cat, secretin has no affect on histamine-stimulated acid secretion.

2369 INFLUENCES OF DUODENAL ACIDIFICATION ON ACID AND PEPSIN SECRETION OF THE STOMACH IN DOGS. *(E.)* Nakajima, S. (Creighton U. Sch. Med., Omaha, Nebr.) and D. F. Magee. *Amer J Physiol* 218(2):545-549, 1970.

The influences of duodenal acidification on acid and pepsin secretion of the stomach was studied in 4 unanesthetized dogs with Heidenhain pouches and separated duodenal pouches. Duodenal acidification was effective in suppressing the acid response to gastrin pentapeptide. The pepsin outputs from Heidenhain pouches in response to pentapeptide, histamine, or metacholine stimulation were increased over the duodenal pH range 5.0 to 3.0 and at duodenal pH 1.0, the pepsin outputs were reduced to control levels or lower. Secretin was a potent stimulant of pepsin secretion while cholecystokinin-pancreozymin significantly inhibited pepsin outputs whether unstimulated or stimulated by secretin. Duodenal acidification apparently releases secretin over the pH range 5.0 to 3.0 and cholecystokinin-pancreozymin at a lower pH.

2370 INHIBITION OF ENDOGENOUS GASTRIN ACTIVITY BY ANTIBODIES TO THE CARBOXYL-TERMINAL TETRAPEPTIDE AMIDE OF GASTRIN. *(E.)* McGuigan, J. E. (U. Florida Sch. Med., Gainesville), B. M. Jaffe and W. T. Newton. *Gastroenterology* 58(2):151-156, 1970.

A series of experiments was performed to determine whether incubation of gastrin with antibodies directed against its functional carboxyl-terminal tetrapeptide amide inhibits the physiological effects of endogenous gastrin. Endogenous gastrin release was stimulated in the perfused pyloric-ligated rat stomach by gastric irrigation with acetylcholine. Control rat experiments demonstrated that acid secretory responses to intragastric acetylcholine were reproducible and reliable (the second response in each rat varied from 10% higher to 15% lower than the first). In experimental rats, passive administration of antibody-containing globulin during endogenous release inhibited the expected increase in acid secretion an average 73% (47% to 100%). The gnitude of response to the second stimulation was nsiderably less than the corresponding initial imulation. There was no overlap in the degree of hibition between any animals in the control and perimental groups. The experiments document that tibodies to the functional portion of the gastrin lecule inhibit the acid secretory effects of endo- nous gastrin.

71 THE EFFECT OF HISTALOG ON CANINE GASTRIC ACID, MUCUS AND PEPSIN SECRETION. *(E.)*

se, L. (Washington U. Sch. Med., St. Louis, Mo.) d W. F. Ballinger II. *Ann Surg* 171(2):229-235, 70.

istalog-induced gastric secretion and dissolved astric mucus secretion were studied in 8 healthy ogs with innervated total gastric pouches. Hista- og (50 mg i.m.) caused a statistically significant ise in the rate of secretion, free and total acid oncentrations and free and total acid outputs. Be- ause of the rise in the amount of gastric juice mainly water) secretion (+400%), histalog caused relative fall in the gastric concentration of mu- us and its constituents and pepsin. Histalog did ause a rise in the gastric output of mucus and epsin, and also a change in the biochemical com- osition of the mucus (causing a rise in the carbo- ydrate/protein ratio from 0.026 to 0.038). Changes ithin the carbohydrate moiety were not very signif- cant, there being a slight rise in the sialic acid nd hexose contents, and a fall in hexosamine and ucose. In the soluble mucus, the carbohydrate con- ent rose from 2.6% to 3.7% and the protein content ell from 97.4% to 96.3%; tyrosine content rose rom 2.46% to 3.70%. There was a significant rise n output of the enzyme-resistant acid mucopolysac- haride (+107%).

372 A RANDOM SAMPLE FROM WALES: IV. CIRCULATING GASTRIC AND THYROID ANTIBODIES AND NTI-NUCLEAR FACTOR. *(E.)*

Jacobs, A. (Welsh Nat. ch. Med., Cardiff, Wales), C. C. Entwistle, H. ampbell and W. E. Waters. *Brit J Haemat* 17(6):589- 95, 1969.

lotted blood samples from 483 men and 506 women ere used to determine the prevalence of antibodies o parietal cells, intrinsic factor, and thyroid utoantibodies in the population of Wales. Women ad a higher prevalence of these antibodies than en and their frequency increased significantly with ge. There was a significant association between he presence of thyroid and gastric autoantibodies n women but not in men. Parietal-cell antibodies ere more common in men with low hemoglobin levels. ntrinsic factor antibody was found in 3 of the 506 omen.

2373 INHIBITION OF GASTRIC ACID SECRETION BY A POTENT SYNTHETIC PROSTAGLANDIN. *(E.)*

Lippmann, W. (Ayerst Lab., Montreal, Quebec, Canada). *J Pharm Pharmacol* 22(1):65-67, 1970.

A synthetic prostaglandin (9-oxo-15ξ-hydroxyprostanoic acid) was tested for its effect on gastric acid secretion in rats (using the procedure of Shay, Sun, and Gruenstein) and in rats given repeated small doses (5 injections s.c. of 1 μg/kg each) of pentagastrin. The prostaglandin (0.8 mg/kg) inhibited basal gastric acid secretion (52%) and prevented an increase in secretion at 6.4 mg/kg but not at 3.2 mg/kg when administered with pentagastrin.

2374 INHIBITION OF GASTRIC ACID SECRETION IN MAN BY PEPTIDE ANALOGUES OF CHOLECYSTOKININ.

(E.) Grossman, M. I. (VA Ctr., Los Angeles, Calif.), A. Agosti, A. M. Brooks and G. Bertaccini. *New Eng J Med* 282(10):535-538, 1970.

Pentagastrin was infused intravenously into human subjects at a rate of 1 ug/kg/hr to stimulate gastric acid secretion. One hour after the start of pentagastrin, when acid secretion had reached a plateau, either caerulin, or carboxyterminal heptapeptide amide of cholecystokinin, each in a dose of 0.1 ug/kg/hr, was added to the pentagastrin infusion for one hr. Both peptides produced about 70% inhibition of acid output. Since both peptides have the same carboxyterminal tetrapeptide amide sequence as pentagastrin, it is assumed that the inhibition was accomplished by competing with pentagastrin for a common receptor. In separate tests the indicated dose of caerulin alone produced slight stimulation of acid secretion in 2 of 5 subjects. Screening of related peptides may yield a specific competitive inhibitor of gastrin with even less stimulatory action than was noted with those tested.

2375 ANALYSIS OF INHIBITION OF ACID SECRETION BY CHOLECYSTOKININ IN DOGS. *(E.)*

Johnson, L. R. (VA Ctr., Los Angeles, Calif.) and M. I. Grossman. *Amer J Physiol* 218(2):550-554, 1970.

The inhibition pentagastrin stimulated gastric secretion by cholecystokinin was studied in 4 dogs with Heidenhain pouches and open gastric fistulas. After obtaining a constant level of secretion from the Heidenhain pouches by i. v. infusion of pentagastrin at a constant rate,cholecystokinin was given by constant i.v. infusion for 1 hr. For near-maximal rates of pentagastrin-stimulated secretions, about 0.5 U/kg/hr of cholecystokinin was required for 50% inhibition (2.0 U/kg/hr produced maximal (95%) inhibition). It appears that in the dog, cholecystokinin is an important physiological inhibitor of gastric secretion, for it is effective in doses considerably less than those required for maximal pancreatic secretion and gallbladder contraction (8.0 U/kg hr). From the dose-response curves to pentagastrin alone and pentagastrin plus .25 U/kg/hr of cholecystokinin, Michaelis-Menten analysis was typical of competitive inhibition, indicating that cholecystokinin and gastrin share a common receptor site.

2376 HISTAMINE-CONTAINING EPITHELIAL CELLS IN RAT STOMACH: A POSSIBLE STORAGE SITE FOR THE INTRINSIC FACTOR. *(E.)* Hakanson, R. (Dept. Pharmacol., U. Lund, Sweden), K. Lindstrand, L. Nordgren and C. Owman. *Europ J Pharmacol* 8(3):315-325, 1969.

2377 THE ASSAY OF GASTRIN USING THE PERFUSED RAT STOMACH. *(E.)* Smith, G. M. (U. Coll. Hosp. Med. Sch., London, England), A. J. Lawrence, D. G. Colin-Jones and H. O. Schild. *Brit J Pharmacol* 38(1):206-213, 1970.

2378 PROTECTIVE EFFECT OF THIOPROPERAZINE AND OF TRANXENEMIC ACID (AMCHA) ON GASTRIC VASOMOTOR RESPONSE INDUCED BY POLYMYXIN B IN THE RAT. *(Fr.)* Bel, A. (Hosp. Croix Rousse, Lyon, France), A. Hallacq, M. F. Pillot and J. Nesmoz. *Biol Gastroent* (supp 2):117-126, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

2379 INHIBITORY EFFECT OF AROMATIC DIAMIDINES ON TRYPSIN AND ENTEROKINASE. *(E.)* Geratz, J. D. (U. North Carolina Sch. Med., Chapel Hill). *Experientia* 25(12):1254-1255, 1969.

2380 ANALYSIS ON THE ANTIGENICITY OF HUMAN GASTRIC MUCOSA. *(Jap.)* Kodama, M. (Kyoto U. Med., Japan), Y. Kubo, T. Wakabayasi, S. Chikamatsu, T. Nagata and K. Kawai. *Jap J Allerg* 18(12):959-965, 1969.

2381 METHOD FOR DETERMINING THE HYDROGEN ION CONCENTRATION IN GASTRIC JUICE. *(Ger.)* Poge, A. W. (Surg. Clin., Karl Marx U., Leipzig, Germany) and J. Walther. *Deutsch Z Verdau Stoffwichseldr* 29(2):75-79, 1969.

2382 INCREASED IRON LEVEL IN SERUM AND GASTRIC SECRETION. *(Ger.)* Miederer, S. E. (Med. Clin. Polyclin., U. Erlangen Nurnberg, Germany), P. Deyhle, K. Bodien and R. Ottenjann. *Klin Wschr* 47(23):1288-1289, 1969.

2383 NONPRECIPITABLE NITROGEN FRACTIONS IN HUMAN GASTRIC CONTENTS. *(It.)* Gaglio, M. (Inst. Gen. Clin. Med. Therap. Med., U. Catania, Italy), L. Smilari and F. Marletta. *Arch Ital Mal Appar Dig* 35(6):547-552, 1969.

2384 POLAROGRAPHIC METHOD OF ESTIMATING SERUM PEPSINOGEN: I. RELATIONSHIP BETWEEN THE SERUM PEPSINOGEN LEVEL AND GASTRIC SECRETION. *(Cz.)* Ronsky, R. (Charles U., Prague, Czechoslovakia) and J. Homolka. *Sborn Lek* 71(11-12):308-314, 1969.

2385 THE INHIBITORY EFFECT OF SECRETIN ON GASTRIC ACID SECRETION. *(Pol.)* Konturek, S. (Acad. Med., Cracow, Poland) and B. Gabrys. *Pol Tyg Lek* 25(3):95-97, 1970.

2386 BASIC INDICATORS OF THE ELECTROLYTE BALANCE AND THE GASTRIC HYDROGEN ION EXCRETION IN CHILDREN. *(Pol.)* Bittner, K. (Acad. Med., Poznan, Poland), J. Socha, A. Waligora and J. Machiejewski. *Pol Tyg Lek* 25(1):7-9, 1970.

2387 PHYSIOPATHOLOGY OF GASTRIC HYPERSECRETION IN EXPERIMENTAL CHOLEDOCHOJEJUNOSTOMY. *(It.)* Campodonico, A. (Inst. Clin. Surg. Gen., Surg. Ther., U. Sassari, Italy). *Fegato* 15(2):235-248, 1969.

2388 GAS LIQUID CHROMATOGRAPHY IN THE ANALYSIS OF SULPHATED GLYCOPROTEIN ISOLATED FROM HUMAN GASTRIC JUICE. *(Fr.)* Mathian, R. (Hosp. Eduoard Herriot, Lyon, France), F. Martin, J.L. Vuez and R. Lambert. *Biol Gastroent* (supp. 2):127-136, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

2389 THE EFFECT OF 2-DEOXY-D-GLUCOSE ON GASTRIC RESECTION IN THE DOG. *(Fr.)* Varro, V. (Hos Bichat, Paris, France), M. Mignon, I. Shimazu and S. Bonfils. *Biol Gastroent* (supp 2):109-116, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

2390 STUDIES ON THE HETEROGENITY OF HUMAN GASTRIC ZYMOGENS. *(E.)* Turner, M.D. (U. Rochester Sch. Med. Dent., N.Y.), J.C. Mangla, I.M. Samloff, L.L. Miller and H.L. Segal. *Biochem J* 116(3):397-404, 1970.

o P:Morph (2311)(2323)
o P:Absorp (2346)(2354)
o P:Motil (2356)
o Diagproc (2517)
o D:Stomduo (2580)(2581)(2584)(2587)(2589)(2594)(2597)(2602)(2620)(2621)(2628)
o D:Stomduo:Peptulc (2631)(2635)(2640)(2641)

391 ETHANOL OXIDATION IN RAT-LIVER MITOCHONDRIA. (*E.*) Kiessling, K. H. (Inst. Zoo-
ysiol., U. Uppsala, Sweden). *Chem Biol Inter-
tions* 1(2):165-171, 1969/70.

thanol oxidation and oxidative phosphorylation
oupled to the oxidation were studied in liver mito-
hondria from male Wistar rats. When added to the
itochondria, ethanol was oxidized slowly, but addi-
ion of NAD increased the oxidation rate to the level
f pyruvate oxidation, even with an ethanol concen-
ration as low as 0.2% (4.10^{-3} M). NADP and cyto-
hrome c had no effect on ethanol oxidation while
yrazole rotenone, antimycin A and oligomycin inhib-
ted it. Excluding phosphate acceptors from the
ncubation medium almost completely inhibited ethanol
xidation and this inhibition was not reversed by
ddition of DNP or ATP. The oxidation of ethanol in
he presence of NAD was coupled to phosphorylation
ith a P/O ratio of 1.5 (2.5 with pyruvate and 0.5
ith NADH) and was not affected by removal of ADH
rom the mitochondria by repeated washings with iso-
onic sucrose or by preincubation in a hypotonic
edium.

392 RELATIONSHIPS OF ATP TO FATTY LIVER: EFFECTS OF ADENINE ANALOGUE, 4-AMINOPYRAZOLO-
YRIMIDINE ON LIPID METABOLISM IN RAT LIVER. (*E.*)
ttani, V. (Inst. Chem. Biol., U. Bologna, Italy),
. Puddu, P. Zanetti and M. Marchetti. *Metabolism*
9(2):140-147, 1970.

he effects of 4-aminopyrazolopyrimidine on the
ipid content, on lipogenesis and on ATP and nico-
inamide nucleotide levels in the liver of Wistar
ats were studied at various time intervals follow-
ng intraperitoneal injections of 4-aminopyrazolo-
yrimidine at a dose of 6 mg/100 gm of body weight (control rats received isotonic saline injections). In rats receiving 4-aminopyrazolopyrimidine, there
as an increase in total liver lipid content from
n initial value of 56.6 ± 1.7 mg/gm tissue, to a 3 hr post-injection value of 68.5 ± 1.9 mg/gm tissue, and rising to a 16 hr post-injection peak of 92.2 ± 2.5 mg/gm tissue before leveling off. The incorporation rate of 1-^{14}C acetate into total lipids *in vitro* is decreased 8 hr post-4-aminopyrazolopyrimidine administration from an initial value of 16140 ± 1400 counts/min/gm tissue to 3150 ± 310 counts/min/gm tissue. ATP concentration appears significantly increased ($P<.01$) three hr after 4-aminopyrazolopyrimidine injection from an initial value of 2160 ± 39 mμmoles/gm tissue to 3010 ± 36 mμmoles/gm tissue, but then rapidly decreases reaching its lowest value of 390 ± 32 mμmoles/gm tissue 27 hr after 4-aminopyrazolopyrimidine treatment. In the fatty liver induced by 4-aminopyrazolopyrimidine administration, there was a more than two-fold decrease in NADH and NADPH concentration ratio, 17 hr after injection, as compared with an initial ratio of 12.6.

2393 A CHROMATOGRAPHIC SEPARATION OF BILIRUBIN GLUCURONIDES FROM HUMAN BILE. (*E.*) Jacobsen, J. (Dept. Biochem. A, U. Copenhagen, Denmark). *Acta Chem Scand* 23(9):3023-3026, 1969.

Chromatographic separation of bile pigments from human bile produced 2 fractions, bilirubin diglucuronide (fast fraction) and a pigment with a one-to-one ratio of bilirubin to glucuronic acid (slow fraction). Both fractions showed fast coupling with diazotized sulfanilic acid, even when the ethanol was evaporated and thin layer chromatography of the azo-coupling product from the fast fraction gave only one band, corresponding to Azo-pigment B while the slow fraction produced 2 bands corresponding to Azo-pigments A and B (occasionally other bands were seen, especially one with a very low R_f value). The yield of pigments in the chromatography was in most cases above 90%. By evaporating and weighing eluate from a thoroughly washed column it was shown that 1 ml contained 25-50 μg of solid material.

2394 *N*-ACETYL-β-GLUCOSAMINIDASE ACTIVITY IN REGENERATING RAT LIVER. (*E.*) Suematsu, T. (Osaka U. Med. Sch., Japan), N. Iwabori and T. Koizumi. *Biochim Biophys Acta* 201(2):378-380, 1970.

The specific activity (nmoles of p-nitrophenol/mg protein/min) of *N*-acetyl-β-glucosaminidase in whole homogenates and subfractions of liver was determined in healthy rats and in rats with damaged (CCl_4) liver after partial hepatectomy. Healthy rats exhibited elevated (15.2) specific activity (24 hr after sham operation) which decreased (12.4) after 48 hr. Rats with damaged livers exhibited elevated (19.7) specific activity which did not decrease 48 hr after hepatectomy. *N*-acetyl-β-glucosaminidase activity seemingly is higher in damaged liver than in healthy liver.

2395 PLASMINOGEN ACTIVATOR IN BILE STIMULATED BY SODIUM TAUROCHOLATE IN ISOLATED HAMSTER LIVERS. (*E.*) Oshiba, S. (Mayo Clin., Rochester, Minnesota) and L. J. Schoenfield. *Proc Soc Exp Biol Med* 133(1):89-92, 1970.

The effect of sodium taurocholate on the secretion of bilokinase into the bile was determined in 4 hamsters with bile fistulas and in perfused isolated hamster livers. In the 4 hamsters with bile fistulas, the bile flow rate and the bilokinase activity in bile increased during infusion of 24 μmoles of sodium taurocholate while during 5 hr of control infusions of saline without sodium taurocholate, bile flow and bilokinase activity remained essentially unchanged. Bile flow remained unchanged during the first 3 hr of perfusion and decreased slightly though significantly in the fourth hr while the bile acid and the bilokinase activity concentrations decreased significantly during each of the first 3 hr of perfusion and remained low during the 4th hr. After the addition of sodium taurocholate to the perfusion fluid, bile flow, bile acid and bilokinase activity concentrations increased. Secretin (0.4 U/100 g body weight) produced a 23% increase in bile flow but did not alter the bile acid concentrations or the bilokinase activity. Bilokinase in bile is analogous to urokinase in urine, but its role in coagulation homeostasis or in gallstone formation remains to be determined.

2396 RELATIONSHIP OF THE P:0 RATIO TO THYROID HORMONE CONTENT OF ISOLATED RAT LIVER MITOCHONDRIA. (*E.*) Heninger, R. W. (U. Wisconsin Med. Sch., Madison), F. N. Mong and E. C. Albright. *Proc Soc Exp Biol Med* 133(1):110-113, 1970.

An isotope equilibrium technique was used to measure liver mitochondrial thyroid hormone concentration in thyroidectomized, partially thyroidectomized, and intact rats in order to correlate this concentration with the P:0 ratios in the mitochondria. The radioactivity in the mitochondria from the normal rats was present as iodide, thyroxine, and triiodothyronine whereas the radioactivity in mitochondria from completely thyroidectomized rats was present only as iodide. On chromatograms from the partially thyroidectomized rats a substantial amount of the radioactivity was present as iodide but the mitochondria contained varying amounts of thyroxine and triiodothyronine. The P:0 ratio decreased progressively as the hormone content of the mitochondria increased and when the data were grouped according to a range of mitochondrial hormone content, the decrease in P:0 ratio was more evident. The decrease in the P:0 ratio seen in mitochondria from normal rats as compared to mitochondria from completely thyroidectomized rats was due to an increase in oxidation occurring in the normal rats; phosphorylating efficiency remained unchanged. There appeared to be an inverse linear relationship between mitochondrial thyroid hormone content and the P:0 ratio.

2397 INTERACTION OF AROMATIC AMINES WITH RAT-LIVER PROTEINS *IN VIVO*: III. ON THE MECHANISM OF BINDING OF THE CARCINOGENS, N-2-FLUORENYLACETAMIDE AND N-HYDROXY-2-FLUORENYLACETAMIDE, TO THE SOLUBLE PROTEINS. (*E.*) Barry, E. J. (VA Hosp., Minneapolis, Minn.), D. Malejka-Giganti and H. R. Gutmann. *Chem Biol Interactions* 1(2):139-155, 1969/70.

The soluble proteins of the liver of rats injected i.p. with equimolar amounts of 9-^{14}C-N-2 fluorenylacetamide, N-hydroxy-9-^{14}C-2-fluorenylacetamide and of N-hydroxy-1'-^{14}C-2-fluorenylacetamide were resolved into 5 fractions by stepwise elution from DEAE-cellulose. Binding of the hydroxamic acid was twice as great as that of the amide and the radioactivity of both compounds was bound preferentially to a group of weakly basic proteins eluted in the second fraction (the preferential attraction was attributable, in part, to the interaction of methionine with the positively charged amidonium ion from N-hydroxy-N-2-fluorenylacetamide). Half of the adducts of N-2-fluorenylacetamide were formed via N-hydroxy-2-fluorenylacetamide and the methionine adducts were characterized by alakline cleavage to o-N-(3-methylthio-2-fluorenylacetamide) which was isolated from the hydrolyzates. The acetyl group of N-hydroxy-N-2-fluorenylacetamide was retained by 70 to 80% of the bound compound 12 hr after administration of the labeled hydroxamic acids; 10% of these adducts (8% of the total adducts) released o-N-(3-methylthio-2-fluorenylacetamide) on alkaline hydrolysis. 9-^{14}C-2-Fluorenamine, 9-^{14}C-2-fluorenamine-9-one and 3-methylthio-9-^{14}C-2-fluorenamine were also isolated from the protein hydrolzates and accounted for 4% of the total protein bound radioactivity or for 13 to 20% of the adducts which did not carry the acetyl group of N-hydroxy-2-fluorenylacetamide. The interaction of N-hydroxy-2-fluorenylacetamide with the soluble protein *in vitro* gave highly labeled adducts which lacked the acetyl group of the hydroxamic acid and which resulted from the interaction of 2-nitrosofluorene and of 2-fluorenylhydroxylamine.

2398 ACTION OF POSTHYPOPHYSEAL HORMONES ON THE *IN VIVO* ISOSMOTIC NET WATER TRANSPORT AND ON ADENYL CYCLASE IN RABBIT GALL BLADDER. (*E.*) Cremaschi, D. (Inst. Physiol. Gen., U. Milan, Italy) and M. Galante. *Arch Int Physiol Biochem* 77(5):819-828, 1969.

The effects of arginine-vasopressin, lysine-vasopressin and oxytocin (20 to 500 mU/kg, i.v.) on isosmotic water transport from the gall bladder lumen to blood (as measured by increasing concentration of inulin) and on adenyl cyclase activity on the epithelial cells of the gall bladder (as measured by the conversion of ATP to cyclic AMP) were studied in rabbits. The water transport was slightly increased by lysine- and arginine-vasopressin and was not altered by oxytocin. Gall bladder epithelial cell adenyl cyclase activity was not affected by oxytocin but was increased by lysine-vasopressin.

2399 EFFECT OF HYPERPHYSIOLOGICAL LEVELS OF HEXESTROL ON THE HEPATIC METABOLISM OF NICOTINATE IN THE MOUSE. (*E.*) Dietrich, L. S. (U. Miami Sch. Med., Florida), L. Franklin and B. Farinas. *Proc Soc Exp Biol Med* 133(1):160-163, 1970.

Intrahepatic levels of labeled nicotinate initially decreased within the first few min after i.v. injection of tracer amounts (1.5 to 7.5 µg) of ^{14}C-nicotinate and then increased at a linear rate (for 60 min) in mice. Hepatic NAD and nicotinamide became rapidly labeled following ^{14}C-nicotinate injection and the specific activity of NAD increased much faster than that of nicotinamide during the first min after injection. Treatment with hexestrol reduced (by one-half) the hepatic pool of nicotinamide but not that of NAD and nicotinate, and increased the specific activity of nicotinamide.

2400 EVIDENCE FOR AN HEPATIC ROLE IN THE CONTROL OF SODIUM EXCRETION. (*E.*) Strandhoy, J. W. (Coll. Med. U. Iowa, Iowa City) and H. E. Williamson. *Proc Soc Exp Biol Med* 133(2):419-423, 1970.

Infusion of a small hypertonic sodium chloride load into anesthetized dogs produced an increased natriuresis which was greater when the load was administered directly into the hepatic circulation than when it was infused via the femoral vein. After infusion of 0.05 ml/kg/min of sodium chloride a significant natriuresis was obtained only after portal loading and at double this infusion rate, significant increases in sodium excretion occurred with both routes of administration (but the increase after portal loading was more than 50% greater). At

ate of 0.4 ml/kg/min of sodium chloride no differ-
e was observed between the two routes and there
no difference in systemic loading when a 5% sal-
solution was infused distal to the hepatic cir-
ation into the right atrium at 0.1 ml/kg/min (a
e which resulted in a difference when infused via
portal system). Substitution of a 56% sucrose
ution, isosmotic with 5% sodium chloride, result-
in no difference between portal and femoral in-
ion at 0.1 ml/kg/min for 30 min. The liver seem-
ly is responsive to an increase in sodium concen-
tion rather than to an increase in osmolality in
portal blood.

01 HYPOTHALAMIC REGULATION OF HEPATIC HEXOBARBITAL METABOLIZING ENZYME SYSTEM. (*E.*)
r, V. (Michael Reese Hosp. Chicago, Ill.), T.
wn, D. Bau and S. Siegel. *Europ J Pharmacol*
):31-40, 1970.

ateral electrolytic lesions in the posterior
othalamus of male Sprague-Dawley rats was shown
suppress the activity of the liver microsomal
yme system metabolizing hexobarbital. Lesions
the caudate nucleus, hippocampus, preoptic area
cerebral cortex did not influence the enzyme acti-
y. The *in vitro* enzyme measurements in the post-
othalamic lesioned rats were supported by *in vivo*
surements of hexobarbital sleep time. In caudate
hippocampal lesions, barbiturate sleep time was
ified without any changes in the activity of the
abolizing enzyme. The activity of the enzyme
tem is apparently under the regulatory control
the posterior hypothalamus, possibly through the
ease of specific hypopheseal tropic hormones.

02 ALTERATION OF NORMAL DEVELOPMENT OF DRUG METABOLISM BY INJECTION OF GROWTH HORMONE.
) Wilson, J. T. (Child. Hosp., San Francisco,
.). *Nature* 225(5235):861-863, 1970.

imations of liver microsomal drug-metabolizing
zyme activity in rats receiving a single injection
growth hormone showed that hepatic demethylation
ethylmorphine or aminopyrine was decreased at
, 42 and 58 days of age. The normal age-related
crease in the hepatic metabolism of the 2 drugs
s prevented by a single injection of STH (growth)
rmone in young rats. Similar results were observ-
with smaller doses of STH hormone (0.25 mg/100 g
dy weight). The metabolism of hexobarbital and
inopyrine was measured in 52-day-old rats which
d been treated with albumin or STH hormone, and
rious amounts of each liver fraction were added
a reaction mixture to detect the presence of in-
bitors. No *in vitro* inhibitors were found. No
largement of the liver was noted after STH hormone
jection, nor was there any significant change in
000 g liver supernatant fraction protein (mg/g
ver) compared to control rats of the same age.

03 INFLUENCE OF FEEDING HABITS AND ADRENAL CORTEX ON DIURNAL RHYTHM OF HEPATIC TYRO-
NE TRANSAMINASE ACTIVITY. (*E.*) Cohn, C. (Michael Reese Hosp., Chicago, Ill.), D. Joseph, F. Larin, W. J. Shoemaker and R. J. Wurtman. *Proc Soc Exp Biol Med* 133(2):460-462, 1970.

The influence of feeding habits and the adrenal cortex on the 24 hr rhythm of hepatic tyrosine transaminase activity was studied in intact and adrenalectomized male Holtzman rats by varying the lighting and feeding schedules of the animals. Intact rats with free access to food exhibited a cyclic response in both hepatic tyrosine transaminase activity and adrenal corticosterone content. Rats fed 24 times a day continued to display a significant rhythm in adrenal corticosterone content; however, the amplitude of the daily rhythm in hepatic tyrosine transaminase activity was markedly decreased from 400 to 50% by the hourly feedings. Reversing the lighting schedule caused a parallel change in the time of peak enzyme activity among both ad libitum and wheel-fed rats. In the absence of the adrenal, the amplitude of the tyrosine transaminase rhythm was reduced in animals eating ad libitum, and in animals fed hourly no significant rhythm was seen. Rhythms in food ingestion and adrenal cortical secretions seemingly play roles in the generation of the rhythmicity of hepatic tyrosine transaminase activities but the diurnal variation in adrenal corticosterone content apparently is not related to the cyclicity of food intake.

2404 EFFECTS OF CONTROLLED INTERRUPTION OF THE ENTEROHEPATIC CIRCULATION OF BILE SALTS BY BILIARY DIVERSION AND BY ILEAL RESECTION ON BILE SALT SECRETION, SYNTHESIS, AND POOL SIZE IN THE RHESUS MONKEY. (*E.*) Dowling, R. H. (Boston U. Sch. Med., Mass.), F. Mack and D. M. Small. *J Clin Invest* 49(2):232-242, 1970.

The effects of controlled interruption of the enterohepatic circulation of bile salts by biliary diversion on bile volume, bile salt secretion and synthesis rates, bile salt pool size, and the relationship to fecal fat excretion were studies is 16 rhesus monkeys in which bile from a chronic bile fistula was returned to the intestine through an electronic stream-splitter which, by diverting different percentages of bile to a collecting system, thus providing graded and controlled interruption of the enterohepatic circulation. The increase in hepatic bile salt synthesis in response to interruption of the enterohepatic circulation was limited and reached a maximum rate at 20% interruption and at this level of biliary diversion, the increased hepatic synthesis compensated for bile salt loss so that bile salt secretion and pool size were maintained at normal levels. With diversion of 33% or more, there was no further increase in hepatic bile salt synthesis to compensate for external loss, and as a result there was diminished bile salt secretion, a reduction in bile salt pool size, and steatorrhea. The effects of interruption of the enterohepatic circulation by the stream-splitter were compared with those produced by resection of the distal one-third or two-thirds of the small bowel. While ileal resection appreciably reduced bile salt secretion, the enterohepatic circulation was not abolished and bile salt resorption from the residual intestine was greater after one-third than after two-thirds resection. Jejunal reabsorption of bile salts seemingly occurs in monkeys and may contribute to the normal enterohepatic circulation.

2405 PHOSPHOFRUCTOKINASE AND GLYCOLYSIS IN THE LIVERS OF RATS FED A THROMBOGENIC DIET.

(E.) Simard-Dusquene, N. (Montreal Heart Inst., Canada). *Canad J Biochem* 48(2):222-224, 1970.

The activity of phosphofructokinase and the ratio of the activities of phosphofructokinase and fructose diphosphatase were studied at various intervals in male albino rats fed control diets (laboratory chow or corn oil) and a thrombogenic (butter) diet. The production of lactic acid under aerobic and anerobic conditions was studied using a reconstituted system. Liver supernatant phosphofructokinase activity was increased in rats fed the thrombogenic butter diet for nine weeks. In the livers of these rats the Pasteur effect (aerobic lactic acid production) was decreased. Using glucose as a substrate, the anerobic production of lactic acid (supernatant fraction without mitochondria) was greater for liver supernatants of rats fed the butter diet than for controls: 4.7 ± 0.2, 3.8 ± 0.2, and 5.9 ± 0.4 mμ moles lactic acid formed per mg supernatant protein per min for the groups fed laboratory chow, corn oil diet, and butter diet, resp., for 9 to 10 weeks.

2406 TWO SPECIFIC AZODYE-CARCINOGEN-BINDING PROTEINS OF THE RAT LIVER: THE IDENTITY OF AMINO ACID RESIDUES WHICH BIND THE AZODYE.

(E.) Ketterer, B. (Middlesex Hosp. Med. Sch.,London) and L. Christodoulides. *Chem Biol Interactions* 1(2):173-183, 1969/70.

A study was made of the amino acid residues which bind the azodye metabolites in 2 soluble rat liver proteins, one of which was referred to as the basic azodye-binding protein (mol. wt. 45,000) and the other as the small molecular weight protein (mol. wt. 13,000). Azodye-bound components were released from these proteins by Pronase digestion followed by refluxing in alkali-ethanol and they were then separated by fingerprinting (high voltage electrophoresis and one or two successive chromatographic developments). ^{35}S-Labeled amino acids were administered to the rats together with the azodye. After the administration of L-^{35}S-methionine, azodye-bound components from both types of protein were radioactive; after administration of L-^{35}S-cysteine, only azodye components from the basic protein were radioactive.

2407 LIPID LOWERING INFLUENCE OF ETHYL P-CHLOROPHENOXYISOBUTYRATE IN LIVER OF RATS FED HIGH FAT DIETS.

(E.) Kokatnur, M. G. (Louisiana St. U. Sch. Med., New Orleans) and G.T. Malcom. *Metabolism* 19 (2):120-128, 1970

The effect of dietary ethyl-p-chlorophenoxybutyrate on total lipid, total cholesterol, and triglyceride concentration in liver was studied in male Sprague-Dawley rats maintained on diets high (20%) in corn oil, beef tallow, or medium chain triglyceride (diets were modified with or without added cholesterol and with or without ethyl p-chlorophenoxyisobutyrate and in a control group of rats fed standard laboratory chow. Only the medium chain triglycerides caused a marked depression in growth (weight gain), but ethyl p-chlorophenoxyisobutyrate did increase liver size in treated rats. Ethyl p-chlorophenoxyisobutyrate demonstrated a marked 4- to 5 fold lowering effect on total cholesterol and triglyceride levels in the liver of rats not supplemented with dietary cholesterols. Mean liver lipid concentration in ethyl p-chlorophenoxyisobutyrate-treated group fed corn oil with dietary cholesterol was 310.8 mg/kg, and in the group receiving no dietary cholesterol, was 63.4 mg/kg. Consistent and notable lowering in liver triglycerides was present in rats administered ethyl p-chlorophenoxyisobutyrate despite exogenous dietary cholesterol. The elevation of serum lipids and definite lowering of hepatic lipids in response to ethyl p-chlorophenoxyisobutyrate with and without cholesterol suggests that the influence of ethyl p-chlorophenoxyisobutyrate on the equilibrium between liver and plasma depends upon the level and type of dietary fat.

2408 THE RELATIONSHIP BETWEEN SERUM ALBUMIN AND SULFATE SYNTHESIS: A METHOD FOR THE MEASUREMENT OF SYNTHESIS OF LIVER-PRODUCED PLASMA PROTEINS USING ^{35}S-L-CYSTINE.

(E.) Awwad, H. K. (Med. Res. Inst., Alexandria, Egypt), A. S. El Sheraky, S. A. Helmi, S. K. Shetaiwy and E. J. Potchen. *J Biol Chem* 245(3):469-476, 1970.

A method is proposed whereby serum albumin synthesis is expressed in terms of production of inorganic sulfate in the liver or in the entire organism, following the administration of ^{35}S-L-cycstine. The feasibility of the proposed method was tested by comparing the synthesis rate of the radioiodinated protein measured in the same animal. A good agreement between the two rates was noted in a group of adult rats, whereas an excess of anabolism was observed in young growing animals. The equilibrium between hepatic and plasma radiosulfate concentration was complete within 4 hr after the injection of ^{35}S-cystine. One of the major assumptions implicit in the proposed model is the identity of the hepatic precursor amino acid pool involved in both albumin and inorganic sulfate synthesis.

2409 MODE OF ACTION OF ADRENAL CORTICAL HORMONES: III. STIMULATION OF ^{14}C INCORPORATION FROM $^{14}CO_2$ AND ^{14}C-PYRUVATE INTO GLUCOSE BY TRIAMCLINOLONE IN THE PRESENCE OF ETHANOL IN RAT LIVER SLICES.

(E.) Uete, Y. (Kitano Hosp. Tazuke Kofukai Med. Res. Inst., Kita-ku, Osaka, Japan). *J Biochem* 66(6):799-804, 1969.

The effect of triamcinolone on the incorporation of ^{14}C from $^{14}CO_2$ and ^{14}C-pyruvate into glucose and on the incorporation of pyruvate carbon into fatty acids and CO_2 in rat liver slices was studied in the

sence of sufficient amount of ethanol to inhibit
coneogenesis. Triamcinolone stimulated the ^{14}C
orporation from $^{14}CO_2$ and ^{14}C-pyruvate into glu-
e, but not the ^{14}C incorporation into CO_2 and
ty acids. Methylene blue, which is a redox dye
able of oxidizing $NADH_2$, restored all these
anol inhibitions. Triamcinolone counteracted the
anol inhibition of ^{14}C incorporation from $^{14}CO_2$
^{14}C-pyruvate into glucose, but it did not affect
ethanol inhibition of ^{14}C incorporation from
-pyruvate into CO_2 and fatty acids. It is sug-
ted that the effect of adrenal cortical hormones
stimulate gluconeogenesis primarily through the
H_2/NAD system is unlikely.

0 CYCLIC RESPONSE OF ENERGY LINKED FUNCTIONS
OF LIVER MITOCHONDRIA TO UNCOUPLING THIO-
NE DERIVATIVES. (*E.*) Schafer, G. (Med. U. Sch.
nover, Germany) and K. H. Buchel. *FEBS Letters*
):217-220, 1970.

surement of O_2 uptake in rat liver mitochondria
wed that, after the addition of substrate, res-
ation was accelerated from state 4 to state 3 by
addition of ADP. After completion of the normal
sphorylating cycle, 2-(2',6'-dimethylanilino)-3,
initro-5-chlorothiophene (DDCT) addition (during
controlled state of respiration) did not induce
ew steady state of rapid respiration. After a
iod of stimulated oxygen uptake, the system re-
ned to the state 4 rate of inhibited respiration.
overy from the uncoupled state to the controlled
te was even more pronounced after the addition
2-bromo-3,4-dinitro-5-(4'-chloranilino)thiophene
CT). A single addition of DDCT to liver mitochon-
a established the transitory state 3u, after which
original state 4 rate was fully recovered indica-
g that the uncoupling effect of DDCT disappeared
er a period of time. In aerobic systems oligo-
in did not prevent the occurrence of this cyclic
ponse. A linear correlation apparently exists
ween the $-\Delta O_2$ jump (duration of state 3u) and the
unt of BDCT that is added. After BDCT addition
OH^- production during aerobic phosphorylation of
by liver mitochondria proceeded at a diminished
e for a transitory interval, and then returned
normal.

11 THE EFFECT OF SODIUM TAUROCHOLATE ON THE
HEPATIC MATABOLISM OF SULFOBROMOPHTHALEIN
DIUM (BSP): THE ROLE OF BILE FLOW. (*E.*) Boyer,
L. (Yale U. Sch. Med., New Haven, Conn.), R. L.
heig and G. Klatskin. *J Clin Invest* 49(2):206-
5, 1970.

udies of bile salts in perfused Sprague-Dawley
t livers showed that their major effect was to
crease the BSP transport maximum. When sodium
urocholate was infused in saline at 30 µmoles/hr,
th bile flow and BSP transport maximum increased,
d remained at peak levels of 1.5 ± 0.12 µliter/
n/g liver and 21 ± 3.0 µg/min/g liver, resp.
ring saline infusion alone, both levels were
gnificantly lower (1.06 ± 0.17 µliter/min/g liver
d 15.8 ± 4.16 µg/min/g liver, resp.), and both
ll progressively after the second hour of perfusion. This decline was associated with a decrease in biliary salt excretion and was reversed by adding bile salts to the perfusate. Since the biliary concentration of BSP remained within a narrow range in all experiments, the BSP transport maximum was primarily determined by the rate of bile flow. Dependence of BSP transport maximum on the rate of bile production was further confirmed by changing the temperature of the perfusate during a constant infusion of taurocholate. The BSP transport maximum paralleled temperature-induced changes in bile flow irrespective of changes in the level of bile salt excretion.

2412 INCORPORATION OF LABEL FROM 5-FLUOROOROTATE INTO NON-RIBOSOMAL CYTOPLASMIC RNA IN RAT LIVER. (*E.*) Cihak, A. (Inst. Organ. Chem. Biochem., Czechoslovak Acad. Sci., Prague) and H. C. Pitot. *FEBS Letters* 6(3):206-208, 1970.

The incorporation of label from 2-^{14}C-5-fluoroorotic acid or 6-^{14}C-orotate (5 µC /µmole i.p.) into cytoplasmic RNA in liver of rats was studied by column chromatography and sucrose density gradient ultracentrifugation. There was coincident labeling of 18 and 28 S ribosomal RNA peaks with orotate but not with fluoroorotic acid; one labeling peak in the region of 18 S ribosomal RNA and a second in the region of 10 S were observed with fluoroorotic acid. Pretreatment with actinomycin D produced a complete loss of coincident labeling (18 and 28 S) with orotate but only slight inhibition of labeling with fluoroorotic acid. RNA labeled by fluoroorotic acid does not appear to be ribosomal but of another species.

2413 *IN VITRO* STUDIES OF THE STABILITY OF LIVER LYSOSOMES AFTER *IN VIVO* TREATMENT OF RATS WITH SULFAPYRIDINE. (*E.*) Karlsson, H. O. (Inst. Zoophysiol., U. Uppsala, Sweden). *Experientia* 25(12):1290-1291, 1969.

The release of acid phosphatases from lysosomes in a lysosome-rich subcellular fraction of liver was studied in rats treated with sulfapyridine (0.6 to 0.8 g/kg, p.o.). Total activity of phosphatase in the lysosome-rich fraction (after sedimentation) was similar in sulfapyridine-treated (9.3 µmoles phosphate/ml/10 min) and untreated (9.9 µmoles phosphate/ml/10 min) rats. Phosphatase activity in the 1500 g supernatant from the incubated lysosome-rich sediment was higher in sulfapyridine-treated (1.8 µmole phosphate/ml/10 min) than in untreated (1.3 µmole phosphate/ml/10 min) rats. Released phosphatase activity (expressed as a percentage of the total sedimented activity) of the sediment after incubation was lower (by 34%) in sulfapyridine-treated rats (this may be due to a direct stabilizing effect of sulfapyridine or its metabolites).

2414 STUDIES ON THE METABOLISM OF C_{19} STEROIDS IN RAT LIVER: 6α-HYDROXYLATION OF 3-OXO-Δ^4-STEROIDS IN RAT LIVER MICROSOMES. (*E.*) Gustafsson, J. A. (Karolinska Inst., Stockholm, Sweden) and B. P. Lisboa. *Europ J Biochem* 12(2):369-374, 1970.

Testosterone and androstenedione were incubated with 105000 x g microsomes of rat liver and ether-chloroform extracts of the incubated material were subjected to single and multiple one-dimensional thin layer chromatography (preparative and analytical) and to gas chromatography-mass spectrometry. Incubation with testosterone yielded a compound behaving like 6α-hydroxytestosterone and with androstenedione yielded one like 6α-hydroxyandrostenedione. A 6α-hydroxylase acting on 3-oxo-Δ^4-C_{19}-steroids is present in rat liver.

2415 INFLUENCE OF X-IRRADIATION ON ENZYME INDUCTION: PHOSPHOENOLPYRUVATE CARBOXYKINASE IN THE LIVER OF IRRADIATED MICE. *(E.)* Berndt, J. (Radiol. Inst. U. Frieburg, Germany), I. Brecht and E. Kofler. *Z Naturforsch* 24(12):1534-1537, 1969.

The influence of whole-body X-irradiation (690 to 4000R) on the induction of phosphoenolpyruvate carboxykinase in the livers of normal or adrenalectomized white mice 6 hr after i.p. injections of 1 mg of hydrocortisone and after a 24-hr fast was determined by the enzyme analysis method of Czok and Eckert. Both the normal and the adrenalectomized mice demonstrated a threefold increase (from 3.3 to 10.1 μmoles/mg protein/hr and from 3.9 to 11.3 μmoles/mg protein/hr, resp.) in phosphoenolpyruvate carboxykinase activity after administration of hydrocortisone and irradiation did not significantly alter this activity. Following 24-hr starvation, both the normal and adrenalectomized animals again exhibited a three- to fourfold increase (from 3.3 to 12.1 μmoles/mg protein/hr and 3.9 to 13.2 μmoles/mg protein/hr, resp.) in phosphoenolpyruvate carboxykinase activity and irradiation with 690, 2000 and 4000R did not change the activity. The induction of phosphoenolpyruvate carboxykinase is not affected by the irradiation in hormone-treated or in fasting normal or adrenalectomized mice as compared to the controls and the assumption that the protein synthesizing system in the living cell is very resistant to ionizing radiation is supported.

2416 THE EFFECTS OF PYRIDINE NUCLEOTIDES AND GLYCEROL ON LIPID PHOSPHORYLATION IN RAT LIVER MITOCHONDRIA. *(E.)* Fang, M. (U. Rochester Sch. Med. Dent., N. Y.) and G. V. Marinetti. *Biochim Biophys Acta* 202(1):91-105, 1970.

The site and mechanism of lipid synthesis were investigated by measuring the incorporation of labeled inorganic phosphate, ATP, and glycerol into phospholipids in isolated mitochondria of rat liver. Chromatographic, enzymatic and chemical methods provisionally identified the principally labeled mitochondrial lipid as phosphatidyl glycerol phosphate and the labeling (by inorganic P^{32}) increased with the addition of oxidizable substrates (glutamate and succinate) and decreased with the addition of inhibitors of oxidative phosphorylation (2,4-dinitrophenol, rotenone, and oligomycin). Labeling from ATP was similar except that oligomycin did not inhibit the labeling suggesting that ATP is the more direct phosphate donor for phosphatidyl glycerol phosphate. The addition of NAD+ or glycerol to the system increased incorporation of label but the greatest effect was observed when both were added (10 mM glycerol and 10 mM NAD+ yielded 24.5 nmoles of phosphatidyl glycerol phosphate after 30 min compared to 8.65 nmoles with glycerol alone and 2.5 nmoles with NAD+ alone). Atractyloside (20 μM) inhibited the incorporation of label from P_i but not from ATP indicating that lipid phosphorylation occurs on the outer surface of the inner mitochondrial membrane or on the outer membrane.

2417 ETHANOL METABOLISM IN THE ISOLATED PERFUSED RAT LIVER. *(E.)* Van Harken, D. R. (Bristol Lab., Syracuse, N. Y.) *Biochem Pharmacol* 18(12):2759-2766, 1969.

The rate of ethanol oxidation was studied in the isolated, perfused rat liver (by measuring the disappearance of ethanol from the perfusion fluid) and in the intact rat (by measuring ethanol disappearance from the whole animal and the oxidation of 1-^{14}C-ethanol to $^{14}CO_2$). The rate of ethanol oxidation in isolated, perfused liver declined with time (from an initial rate of 10 mg/g liver/hr during the first 30-min interval to 4 mg/g liver/hr during the interval between 150 and 180 min). Addition of sodium pyruvate or fructose (substances known to promote the conversion of NADH to NAD) either prevented the decline or restored diminished rates of ehtanol oxidation. Between 0 to 7 hr after administration, ethanol disappeared from the whole animal at the linear rate of 325 mg/kg/hr. Initially, the rate of $^{14}CO_2$ formation from 1-^{14}C-ethanol lagged behind the rate of ethanol disappearance in the whole animal but between 3 to 7 hr, the rates were essentially equal. At the end of 9 hr in the whole animal, 94.4% of administered 1-^{14}C-ethanol was oxidized and 90.6% appeared as $^{14}CO_2$. In separate experiments, ethanol (2.7 g/kg i.p.) was administered to rats who were then placed in metabolism chambers. During the first 15 hr after administration, 3.34 ± 0.8% and 0.64 ± 0.04% of the total dose of ethanol were excreted via the pulmonary and renal routes, respectively.

2418 AMINO ACID METABOLISM AND THE BIOSYNTHESIS OF PROTHROMBIN IN THE PERFUSED RAT LIVER. *(E.)* Li, L.F. (St. Louis U. Sch. Med., Mo.), J. Block, R.K. Kipfer and R.E. Olson. *Proc Soc Exp Biol Med* 133(1):168-170, 1970.

The changes in concentration of different amino acids in isolated rat livers were studied during perfusion with a solution of warfarin, glucose, heparin, terramycin and an amino acid mixture. Glutamic acid, valine, isoleucine, and leucine concentrations in isolated liver increased whereas the concentrations of aspartic acid, proline, glycine, alanine, methionine, phenylalanine, lysine and arginine decreased. In livers bathed in warfarin (10 ug/ml), vitamin K1 added at 2 hr(in a concentration of 25 ug/ml) caused

ompt and linear increase in prothrombin but did
affect amino acid metabolism or uptake of leucine-
C. The specific activity of L-leucine-1-^{14}C
d to the perfusate at zero time declined exponen-
ly to 4% of initial values as the concentration
otal leucine increased 5-fold. The prothrombin
hesized under these conditions was highly radio-
ve, suggesting that vitamin K stimulates *de novo*
hesis of this coagulation protein.

VITAMIN E, NICOTINIC ACID, VITAMIN C AND TOTAL BELLADONNA ALKALOIDS AS LIVER CELL
NERATORS. *(E.)* Soliman, M. A. (Fac. Med. Cairo
U.A.R.), H. A. De Hondt and A. M. Elwi. *Pharma-*
gy 2(6):352-360, 1969.

prophylatic effect of vitamin E, nicotinic acid,
min C and belladonna alkaloids on tissue regen-
ion and mitosis was studied in albino mice with
r injury produced by s.c. administration of sub-
al (4 ml/kg) and lethal (8 ml/kg) doses of car-
tetrachloride. Sublethal doses produced limited
l necrosis of liver cells but did not affect
sis whereas lethal doses produced extensive de-
rative necrosis and complete inhibition of mito-
Pretreatment with belladonna alkaloids
5 mg) or vitamin C (30 mg), 30 min prior to ad-
istration of lethal dose of carbon tetrachloride
tly increased the degree of regeneration and
uency of mitosis. Less effective degrees of re-
ration and frequency of mitosis were produced
retreatment with vitamin E (50 and 100 mg) and
tinic acid (50 mg). Occurrence of binucleate
ls and carbon tetrachloride-induced chromosomal
rmalities were not affected by pretreatment
any of the compounds.

0 SUBSTRATE BINDING TO CYTOCHROME P-450 OF LIVER AND ADRENAL MICROSOME. *(E.)*
enius, S. (Dept. Biochem., U. Stockholm, Sweden),
Kupfer and L. Ernster. *FEBS Letters* 6(3):249-
, 1970.

e Sprague-Dawley rats and albino guinea-pigs were
d to study the interaction between the various
strates in the microsomal monooxygenase system
their binding to cytochrome P-450. Addition of
obarbital, aminopyrine, testosterone and laurate
the liver microsomes induced type I spectral
nges. The binding affinities for testosterone
laurate were considerably higher than those for
obarbital and aminopyrine. The spectral changes
cited by the addition of increasing amounts of
obarbital to rat liver microsomes were measured
the absence and presence of various concentrations
aminopyrine. It was demonstrated that aminopyrine
ed as a competitive inhibitor of the spectral
nge produced by the addition of hexobarbital
e apparent K_s for hexobarbital was increased in
presence of aminopyrine). Similar results were
ained when the titration of the spectral change
h hexobarbital was performed in the presence of
tosterone or laurate in various concentrations.
ration of the type I spectral change by the addi-
n of increasing concentrations of cortisol
cinate rendered an apparent K_s of 0.25 mM. In
the presence of hexobarbital the spectral change induced by cortisol succinate was markedly inhibited.

2421 PHOSPHORYLATION OF LIVER HISTONE FOLLOWING THE ADMINISTRATION OF GLUCAGON AND INSULIN.

(E.) Langan, T.A. (Chas. Kettering Res. Lab., Yellow Springs, Ohio). *Proc Nat Acad Sci* 64(4):1276-1283, 1969.

The phosphorylation of liver histone was studied in Holtzman or Charles River rats which were fasted overnight and injected i.p. with glucagon or insulin (0.5 ml of 0.14 M NaCl). Some animals were injected with 2mCi of ^{32}P-phosphate in 0.5 ml of 0.14 M NaCl containing 10^{-4}M carrier inorganic phosphate immediately after hormone administration while controls received ^{32}P-phosphate. The incorporation of ^{32}P-phosphate into lysine-rich histone was determined by isolation of a tryptic peptide which contained the phosphorylated serine residue. This peptide was identical to the major tryptic phosphopeptide obtained from lysine-rich histone after phosphorylation *in vitro* by a purified cyclic AMP-dependent liver histone kinase preparation. Glucagon (given in doses which are effective in inducing enzyme synthesis) produced a 15-to 25-fold increase in phosphorylation of this specific serine residue in rat liver lysine-rich histone shortly after administration. Insulin induced an actinomycin-sensitive synthesis of enzymes in the liver and also increased histone phosphorylation. The induction of RNA synthesis seemingly may occur through a change in DNA-histone interaction resulting from histone phosphorylation.

2422 EFFECT OF BASIC CUPRIC ACETATE ON THE BIOCHEMICAL CHANGES IN THE LIVER OF THE RAT FED CARCINOGENIC AMINOAZO DYE: I. CHANGES IN THE ACTIVITIES OF DAB METABOLISM BY LIVER HOMOGENATE.

(E.) Yamane, Y. (Fac. Pharm. Sci., U. Chiba, Japan), K. Sakai, I. Uchiyama, M. Tabata, N. Taga and A. Hanaki. *Chem Pharm Bull* 17(12):2488-2493, 1969.

2423 THE EFFECT OF WHOLE-BODY X-IRRADIATION OF GUINEA PIGS ON LIVER RIBONUCLEIC ACID SYNTHESIS.

(E.) Hidvegi, E. J. (Inst. Radiobiol. Res., Budapest, Hungary), E. Boloni, J. Hollard, F. Antoni and V. Varteresz. *Biochem J* 116(3):503-514, 1970.

2424 THE ORIGIN OF MITOCHONDRIAL PHOSPHATIDYLCHOLINE WITHIN THE LIVER CELLS.

(E.) Jungalwala, F.B. (Agric. Res. Coun. Inst. Animal Physiol., Babraham, Cambridge, England) and R.M.C. Dawson. *Europ J Biochem* 12(2):399-402, 1970.

2425 INCORPORATION OF ^{65}Zn IN RAT LIVER NUCLEI.

(E.) Weser, U. (Physiol. Chem. Inst. U. Tubingen, Germany) and E. Bischoff. *Europ J Biochem* 12(3):571-575, 1970.

2426 EFFECTS OF THYROXINE ON THE SYNTHESIS OF FOLATE COENZYMES IN RAT LIVER. *(E.)* Pasquali, F. (Inst. Chem. Biol., U. Bologna, Italy), L. Landi, C. Bovina and M. Marchetti. *Biochem J* 116(2):217-221, 1970.

2427 SUBSTANCES WITH ANTINEOPLASTIC EFFECT: XL. THE INFLUENCE OF SODIUM SALT OF B-4-METHOXYBENZOYL-B-BROMACRYLIC ACID (MBBA) AND SOME RELATED SUBSTANCES ON THE RESPIRATION OF RAT LIVER HOMOGENATE AND YOSHIDA ASCITES RAT SARCOMA CELLS: THE INFLUENCE OF THESE SUBSTANCES ON THE MECHANISM OF OXIDATIVE PHOSPHORYLATION OF THE LIVER HOMOGENATE. *(E.)* Helia, O. (Fac. Pharm. Komensky U. Bratislava, Czechoslovakia), A. Jindra and M. Semonsky. *Neoplasma* 16(6):597-604, 1969.

2428 FATTY ACID SPECIFICITY IN THE BIOSYNTHESIS OF DIGLYCERIDES AND TRIGLYCERIDES IN RAT LIVER *IN VITRO (E.)* Raju, P.K. (Dept. Biochem. Biophys. Texas A&M U., College Station) and R. Reiser. *Biochem Biophys Acta* 202(1):212-215, 1970.

2429 CORTICOSTEROID METABOLISM AND LIVER GLYCOGEN IN FETAL AND NEWBORN MICE. *(E.)* Burton, A.F. (Cancer Res. Ctr., U. British Columbia, Vancouver, Canada), R.M. Greenall and R.W. Turnell. *Canad J Biochem* 48(2):178-183, 1970.

2430 ENERGY DEPENDENT BIVALENT CATION TRANSLOCATION IN RAT LIVER MITOCHONDRIA. *(E.)* Vainio, H. (Dept. Biophys, Phys. Biochen., U. Pennsylvania, Philadelphia), L. Mela and B. Chance. *Europ J Biochem* 12(2):387-391, 1970.

2431 ELECTROPHORETIC BEHAVIOR OF CERTAIN ENZYMATIC PROTEINS (LDH, GOT, LAP, G6PD) OF LIVER AND HEART OF ALBINO RATS IRRADIATED WITH X-RAYS. *(It.)* Notario, A. (Dept. Gen. Clin. Med. Ther., U. Pavia, Italy), E. B. Pallavicini, R. Rodolico and S. Marciano. *Minerva Radiol* 14(10):443-453, 1969.

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- P:Absorp (2333)(2343)(2351)
- P:Gen (2484)(2491)(2497)
- Diagproc (2537)
- D:Livbil (2800)(2811)(2821)(2822)(2823)(2824) (2825)(2829)(2834)(2835)
- D:Livbil:A.Nonv.Hep (2856)(2857)
- D:Livbil:A.V.Hep (2878)(2882)
- D:Livbil:Cirrh (2891)(2894)(2899)(2900)(2901)
- D:Livbil:Gallb (2911)(2913)
- D:Gen (2947)
- D:Gen:Parasit (3023)

GLUCOSE METABOLISM IN THE MUCOSA OF THE SMALL INTESTINE: CHANGES OF HEXOKINASE /ITY DURING PERFUSION OF THE PROXIMAL HALF OF SMALL INTESTINE. (*E.*) Mayer, R. J. (Dept. hem. U. Nottingham, England), P. Shakespeare ;. Hubscher. *Biochem J* 116(1):43-48, 1970.

proximal half of the small intestine of fed and ved rats was used to study the effects of per- on on hexokinase and lactate dehydrogenase acti- es. Perfusion of preparations from starved rats a glucose-containing medium caused a significant ease in hexokinase activity of the particle-free rnatant which was observed as early as 5 min r the start of perfusion and lasting up to 66 There was no increase in the hexokinase acti- of the particle-free supernatant where a medium g mannitol was used. In fed rats using the glu- medium, hexokinase activity remained unchanged ng the first 15 min of perfusion and then fell ually until, after 66 min, 73% of the original vity remained. Lactate dehydrogenase activity significantly lower in the untreated intestine tarved rats than in fed rats. There was no ificant change with either glucose or mannitol usion. The distribution of hexokinase activity een total particulate fraction and particle-free rnatant was measured in preparations from starved after perfusion for 5 to 10 min. In prepara- s that had not been perfused, the ratio of hexo- se activity in total particulate fraction/parti- free supernatant was significantly higher in ved than in fed animals. After glucose per- on, the total homogenate activity had not changed ificantly, whereas the ratio of hexokinase acti- decreased significantly and approached the value ined with fed animals.

MUCOSAL GROWTH EFFECT OF VITAMIN D ON THE DUODENUM. (*E.*) Urban, E. (U. Texas Med. San Antonio) and H. P. Schedl. *Experientia* 2):1270-1271, 1969.

effect of vitamin D on the growth of duodenal ileal mucosa was studied in Simonsen male no rats. Following vitamin D depletion for o 16 weeks, animals selected at random were eted with 12.5 ug vitamin D_2 4 and 8 days be- study and compared with unrepleted control . A separate but identically managed group of was given 2 mg of vitamin D_2 48 hr before y. The proportion of total intestinal mass esented by the duodenal mucosa (as a percent ry segment weight) was increased significantly days, and there was no further increase by ys. The ileal mucosa showed a smaller increase h was not significant. Similar results were ined when rats were given vitamin D_2 48 hr re study. Although the vitamin D had no effect issue water content, there was a small, con- ent but insignificant increase in wet weight unit length of full thickness segments. Growth s place primarily in the mucosal portion of enal tissue rather than both mucosa and under- g tissue.

2472 AN INHIBITORY ACTION OF HISTAMINE ON THE GUINEA-PIG ILEUM. (*E.*) Ambache, N. (Roy. Coll. Surg. England, London) and M. Aboo Zar. *Brit J Pharmacol* 38(1):229-240, 1970.

In atropinized, plexus-containing preparations of the longitudinal muscle from the guinea-pig ileum, in which histamine contractions were abolished by mepyramine or diphenylhydramine, an inhibitory action of histamine was revealed on the tetanic spasms produced by field stimulation. The inhibitory action of histamine on the atropine-resistant tetanic spasms was reversible and was specific for the tetanic spasms, since histamine did not reduce contractions elicited by bradykinin, 5-hydroxytryptamine, prostaglandin E_2, nicotine or dimethylphenylpiperazinium. L-Histidinol and 2-mercaptohistamine exerted a considerably weaker inhibitory effect upon the tetanic spasms than histamine. Four other imidazoles tested (1-histidine, murexine, dihydromurexine and imidazolecarboxycholine) were ineffective as was betazole. The inhibitory action of histamine persisted after adrenoceptor blockade by phentolamine and pronethalol and after prior reserpinization of the guinea-pigs and also occurred after ganglionic paralysis by hexamethonium or dimethylphenylpiperazinium but was antagonized specifically by nicotine. In atropinized preparations of the longitudinal muscle from the guinea-pig decending colon, histamine exerted an insignificant inhibitory effect on the tetanic spasms.

2473 INTESTINAL DRUG ABSORPTION AND METABOLISM: I. COMPARISON OF METHODS AND MODELS TO STUDY PHYSIOLOGICAL FACTORS OF *IN VITRO* AND *IN VIVO* INTESTINAL ABSORPTION. (*E.*) Barr, W. H. (Sch. Pharm. St. U. New York, Buffalo) and S. Riegelman. *J Pharm Sci* 59(2):154-163, 1970.

The effects of metabolism, tissue accumulation and blood flow on the transport of salicylamide into the mesenteric blood were studied in the *in vitro* cannulated everted rabbit intestinal sac and in the *in vivo* rabbit intestinal loop with complete mesenteric venous collection. At low initial concentration (10^{-3}M) over 60% of salicylamide appearing in the mesenteric blood is conjugated with glucuronic acid. At higher initial mucosal fluid concentrations, glucuronide conjugation is capacity-limited and the disappearance from the lumen-curve shows a distinct distributive phase characteristic of a cell compartment model. The rate of transport of free drug across the basal barrier is blood flow rate-limited while transport of glucuronide is independent of blood flow. Appearance of free salicylamide into mesenteric blood, *in vivo* shows a lag time of 4 min compared to a lag time of 10 min into serosal fluid, *in vitro*. The steady state rate of free salicylamide into the plasma *in vivo* is five to ten times greater than into the serosal fluid *in vitro* at the same mucosal concentrations. The *in vivo* intestinal loop with complete venous collection was found to be a reliable method of measuring intestinal drug absorption.

2474 THE EFFECTS OF BETA ADRENOCEPTOR BLOCKING AGENTS ON THE MEMBRANE POTENTIAL AND SPIKE GENERATION IN THE SMOOTH MUSCLE OF GUINEA PIG TAENIA COLI. *(E.)* Davis, W. G. (St. Bartholomew's Hosp., London, England). *Brit J. Pharmacol* 38(1):12-19, 1970.

The measurement of changes in spike generation and membrane resistance in the guinea-pig taenia-coli, using the sucrose gap extracellular recording method, was shown to be a useful way to demonstrate the intrinsic sympathomimetic activity of the beta adrenoceptor blocking agents. Pronethalol, N-isopropyl-p-nitrophenyethanolamine hydrochloride, 4(2-isopropylamino-1-hydroxyethyl) methansulphonanilide hydrochloride, 4(2-methylamine-1-hydroxypropyl) methansulphonanilide hydrochloride and dichloroisoprenaline abolished the spontaneous spike discharge and produced a hyperpolarization of the cell membrane. These effects were blocked by a mixture of phentolamine and propranolol. Propranolol reduced the frequency of the spontaneous spike potentials but did not raise the resting membrane potential of the taenia coli. When the metabolism of the taenia coli was depressed, all the beta adrenoceptor blocking agents produced a depolarization of the cell membrane and sometimes initiated spike potential activity. The depolarization of the cell membrane was antagonized by superfusing the taenia coli with Krebs solution containing phenotolamine. The effects of the beta adrenoceptor blocking agents were not antagonized by the presence of atropine. Depletion of the stores of catecholamines did not modify the sympathomimetic actions of the beta adrenoceptor blocking agents on the normal or metabolically depressed taenia coli preparation. The action of the beta blocking agents did not appear to be mediated through the release of catecholamines within the taenia coli.

2475 MECHANICAL RESPONSE OF GUINEA PIG TAENIA COLI IN HIGH-K/Na-DEFICIENT MEDIUM UNDER ANOXIA. *(E.)* Ganeshanandan, S. S. (Fac. Agric. U. Tokyo, Japan), H. Karaki, M. Ikeda and N. Urakawa. *Jap J Pharmacol* 19(2):329-330, 1969.

2476 INVESTIGATIONS ON THE PARASYMPATHOLYTIC EFFECT OF TOXOGONIN ON THE GUINEA-PIG ISOLATED ILEUM. *(E.)* Kuhnen-Clausen, D. (no affil). *Europ J Pharmacol* 9(1):85-92, 1970.

2477 PHARMACOLOGY OF THE MECHANICAL ACTIVITY OF THE COLONIC MUCOSA IN CATS. *(It.)* Onori, L. (2nd Med. Clin., U. Rome, Italy), C. A. Friedmann, G. M. Frigo, L. Capurso and A. Aluffi. *Arch Ital Mal Appar Dig* 35(6):618-626, 1969.

2478 OPSONIZING AND ^{32}P-RELEASING ACTIVITIES OF RAT INTESTINAL STRANGULATION FLUID ON ^{32}P-LABELED *E. COLI*. *(E.)* Trippestad, A. (U. Hosp., Oslo, Norway). *Acta Path Microbiol Scand* 77(2):258-266, 1969.

2479 G-2 POPULATION CELLS IN MOUSE KIDNEY AND DUODENUM AND THEIR BEHAVIOR DURING THE CELL DIVISION CYCLE *(E.)* Pederson, T. (Dept. Zool., Syracuse U., New York) and S. Gelfant. *Exp Cell Res* 59(1):32-36, 1970.

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- P:Absorp (2325)(2327)(2328)(2334)(2336)(2338)(2339)(2340)(2341)(2342)(2344)(2348)(2349)(2355)
- P:Motil (2360)
- P:Gen (2484)(2492)
- D:S.Intest (2659)(2660)
- D:S.Intest:Malabs (2683)(2690)
- D:Livbil (2801)

LIVER BLOOD FLOW AND INTRAVASCULAR COLLOID CLEARANCE ALTERATIONS FOLLOWING PARTIAL
TECTOMY. *(E.)* Saba, T.M. (U. Illinois Coll. Med.,
ago). *J Reticuloendothel Soc* 7(3):406-417, 1970.

tic sinusoidal blood flow and intravascular
ocytic clearance of gelatinized ^{131}I "re
iculoendothelial) test lipid emulsion" and
oidal carbon were studied in male Holtzman rats
owing partial hepatectomy. Rate of intravascu-
phagocytosis of colloidal carbon (16 mg/100 gm)
markedly decreased 10 min after partial hepatec-
and there was a 3.3-fold increase in half-time
) for carbon clearance in the hepatectomized
p compared to 12.6 ±0.9 min in normal rats (p
1). In addition, intravascular phagocytosis of
d emulsion (50 mg/100 gm) was significantly
essed at 10 min posthepatectomy as indicated by
fold increase in t/2 compared to 10.9±1.2 min
ontrols. Spleen and lung weights did not change
epatectomized rats. Normal and sham-operated
demonstrated comparable liver, lung, and spleen
lization of the labeled emulsion. Partially
tectomized rats showed a significant decrease
5%) in total liver uptake. Ten min after partial
tectomy, minimum total hepatic sinusoidal blood
decreased 50.5% (control value 11.50 ± 3.26
in), while perfusion of the residual mass in-
sed 81.5%. While partial hepatectomy will de-
s intravascular phagocytosis, enhanced perfusion
he residual liver mass seemingly will result in
eased liver phagocytic uptake on a weight basis.

EFFECT OF SULFATION ON THE GASTROINTESTINAL ACTIONS OF CERULEIN. *(E.)* Grossman,
. (VA Ctr., Los Angeles, Calif.), L. R. Johnson
G. F. Stening. *Gastroenterology* 58(2):208-216,
).

effect of natural and desulfated cerulein on
ric and pancreatic secretion was studied in 2
of chronic dogs, one having gastric fistulas
Heidenhain pouches and the other gastric and
reatic fistulas. The effects on gallbladder
tractility were determined by open tip manometry
conscious cats with chronic gallbladder fistulas.
ural cerulein (0.75 to 0.60 μg/kg/hr) was approx-
tely 6 times as potent as desulfated cerulein
30 to 1.20 μg/kg/hr) in stimulating acid secre-
n from gastric fistulas and about 5 times as
ent as desulfated cerulein in stimulating pepsin
put (pancreatic responses to desulfated cerulein
e also much less than those to natural cerulein).
ural cerulein (0.25 ng/kg) was approximately 160
es as potent as desulfated cerulein (40 ng/kg)
stimulating gallbladder contractility. Sulfation
the tyrosine in cerulein apparently is necessary
optimal physiological activity, especially in
case of gallbladder contraction, and the position
the tyrosyl residue is of prime importance.

2 RESPONSES OF SAPHENOUS AND MESENTERIC VEINS TO ADMINISTRATION OF DOPAMINE. *(E.)*
k, A. L. (U. Iowa Coll. Med., Iowa City), T.
uka, M. G. Wendling and J. W. Eckstein. *J Clin
est* 49(2):259-266, 1970.

The effects of dopamine on cutaneous and mesenteric veins of dogs were studied to determine if this agent also produced qualitatively different effects on the tone of capacitance vessels (veins) in these vascular beds. The lateral saphenous or the left colic vein was perfused at constant flow with blood from a femoral artery and pressures at the tip of the perfusion cannula and at the tip of the catheter 15 cm downstream were recorded continuously. Increases in the pressure gradient between these two points indicated venoconstriction and decreases indicated venodilation. Dopamine and norepinephrine injected into the perfusion tubing caused constriction of both veins and the constriction was antagonized by phenoxybenzamine-induced blockade of alpha receptors. Dopamine did not produce a dilator effect even after phenoxybenzamine-induced alpha receptor blockade or in the presence of increased venous tone produced by serotonin, norepinephrine, or nerve stimulation. Reserpine and cocaine did not alter responses to dopamine in the saphenous vein suggesting that the venoconstrictor action of dopamine resulted mainly from a direct effect on alpha receptors and that uptake into the sympathetic nerve endings may not be important in regulating the amount of dopamine available to receptors in the saphenous vein.

2483 MESENTERIC BLOOD FLOW RESPONSE TO GLUCAGON ADMINISTRATION DURING TEMPORARY EXCLUSION OF THE LIVER. *(E.)*
Schenk, W. G., Jr. (E. J. Meyer Mem. Hosp., Buffalo, N. Y.), N. G. Kock and S. Tibblin. *Arch Surg* 100(3):280-283, 1970.

The effect of glucagon on superior mesenteric artery flow was studied in 5 anesthetized dogs during temporary liver exclusion. During exclusion the injection of 10 μg/kg of glucagon into the external jugular vein consistently produced an increase in superior mesenteric artery flow. Due to limited shunt capacity in the experiment, portal vein occlusion generally resulted in increased mesenteric vein pressure (pressure decreased in one animal). Blood glucose concentration decreased slowly following glucagon administration, but increased rapidly when liver circulation was restored. Mean increase of blood glucose concentration was 80% within 3 min after release of occluding slings. Vasodilator action of glucagon on the splanchnic vascular bed (as reflected both in increased mesenteric artery flow and rise in mesenteric vein pressure) is not dependent on a functioning liver. Neither increased liver metabolism nor liberation of vasoactive substances from the liver after glucagon administration, can be responsible for splanchnic hemodynamic effects of glucagon which seemingly are caused by interference with neurogenic control of the vascular bed or by direct action on the splanchnic vascular smooth muscle.

2484 ORIGIN AND MOLECULAR SIZE OF IMMUNOGLOBULIN-A IN THE MESENTERIC LYMPH OF THE DOG. *(E.)*
Vaerman, J. P. (U. Clin. St. Pierre, Louvain, Belgium) and J. F. Heremann. *Immunology* 18(1):27-38, 1970.

The content and molecular size of various proteins, especially immunoglobulins (IgA, IgM, IgG, IgG_{2ab} and IgG_{2c}), in serum and mesenteric, thoracic and mixed (intestinal and hepatic) lymph were studied in adult dogs by radial immunodiffusion and density gradient ultracentrifugation. Calculation of lymph *versus* serum concentrations (mg/ml) showed that the highest concentration ratio was that for IgA which was present in higher concentrations in lymph than in serum; the lymph *versus* serum concentrations of the remaining immunoglobulins was linear. IgA from dog serum sedimented faster than human (7S) IgG and slightly slower than human (11S) IgA. The sedimentation rate of dog serum IgA could not be distinguished from that of lymph IgA. Proteins found in mesenteric lymph appear to be exclusively supplied by the intestinal blood capillaries, except IgA which appears to be the product of local synthesis by the intestinal mucosa.

2485 COMPARISON OF PROSTAGLANDIN E_1 AND NOREPINEPHRINE ON THE GASTRIC MUCOSAL CIRCULATION. *(E.)* Jacobson, E.D. (U. Oklahoma Med. Ctr., Oklahoma City). *Proc Soc Exp Biol Med* 133(2):516-519, 1970.

The actions of prostaglandin E_1 and norepinephrine on the inhibition of gastric secretion and on gastric mucosal circulation were compared in 5 mongrel dogs with a gastric fistula. Secretion was stimulated to a steady rate of about 1/3 of maximal by injection (i.m.) of either histamine or pentagastrin. Prostaglandin E_1 or norepinephrine was administered (doses of 0.1 or 1.0 μg/kg/min) and secretion, mucosal blood flow and the ratio of blood flow to secretory rate were measured in the conscious dogs. The high dose of prostaglandin E_1 with either gastric stimulant, significantly decreased secretion to 0.8 ± 0.1 meq/15 min, from a control value of 2.1 ± 0.2 meq/15 min, and also depressed mucosal blood flow. The ratio of blood flow to secretory rate was decreased only by norepinephrine, from a control value of 45.7 ± 2.6 meq 115 min to 21.8 ± 4.9 meq 115 min. Norepinephrine apparently acts to reduce secretion by limiting mucosal blood flow. While prostaglandin E_1 (a powerful vasodilator) reduces secretion by a primary mechanism other than restricting mucosal blood flow.

2486 INFLUENCE OF THE DIGESTIVE TRACT ON THE CATABOLISM OF SERUMALBUMIN IN NORMAL AND RADIATION-INJURED MICE. *(Fr.)* Telia, M. (Inst. Med. Cluj, Rumania), A. Sassen, A.M. Reuter, F. Kennes and J.R. Maisin. *Biol Gastroent* (supp. 2):191-198, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

2487 THE IDENTIFICATION OF EPIMERIC 5-ANDROSTENE-3,16,17-TRIOLS IN PLASMA FROM THE UMBILICAL CORD AND IN MECONIUM, FECES AND URINE FROM INFANTS. *(E.)* Shackleton, C.H.L. (Northwick Park Clin. Res. Ctr., Harrow, Middlesex, England), J. A. Gustafsson and J. Sjovall. *Steroids* 15(1): 131-137, 1970.

2488 EFFECTS OF GLUCOCORTICOIDS AND ACETYLSALICYLIC ACID ON GASTROINTESTINAL PROTEIN SECRETIONS. *(It.)* Jori, G. P. (Inst. Spec. Path. Med., U. Naples, Italy), G. Mazzacca and G. Bulillon. *Minerva Med Giuliana* 9(1):6-7, 1969.

2489 PHARMACOLOGY OF DIMETHYLPOLYSILOXANE; INFLUENCE ON FUNCTIONS OF THE GASTROINTESTINAL TRACT. *(It.)* Buscemi, M. (Inst. Pharmaco U. Palermo, Sicily) and L. Dusonchet. *Clinica* 29(1) 3-31, 1969.

2490 STUDIES ON THE EXOCRINO-ENTERIC CIRCULATION OF *MUS MUSCULUS*. *(E.)* Litchford, R. G. (U. Tennessee, Chatanooga). *Comp Biochem Physiol* 32(1):55-60, 1970.

2491 THE ACTION OF AN ANTIHYPERTENSIVE AGENT ON THE BILIARY SECRETIONS AND EXTERNAL PANCREATIC SECRETIONS OF THE RAT. *(Fr.)* Debray, Ch. (Hosp. Bichat, Paris, France), Ch. Vaille, J. De La Tour, Cl. Roze and M. Souchard. *Rev Int Hepat* 19(6): 425-437, 1969.

2492 ON RELATIONSHIPS BETWEEN INTRAMURAL NERVE PLEXUSES OF THE LARGE INTESTINE AND LYMPHATIC VESSELS IN CAT. *(Rus.)* Tikhonova, L. P. (S. M. Kirov Milit. Med. Acad., Leningrad, USSR). *Arkh Anat* 57(11):78-82, 1969.

2493 STUDIES ON FECAL AMMONIA LEVELS IN INFANTS: I. FECAL AMMONIA LEVELS IN HEALTHY INFANTS. *(Jap.)* Matsuura, K. (Sch. Med. Tokushima U., Japan). *Shikoku Acta Med* 25(5):682-687, 1969.

2494 STUDIES ON FECAL AMMONIA LEVELS IN INFANTS: II. INFLUENCE OF ORALLY ADMINISTERED LACTOBACILLUS PREPARATIONS ON AMMONIA LEVELS IN FECES OF HEALTHY INFANTS. *(Jap.)* Matsuura, K. (Sch. Med. Tokushima U., Japan). *Shikoku Acta Med* 25(5):689-699, 1969.

2495 STUDIES ON FECAL AMMONIA LEVELS IN INFANTS: III. INFLUENCE OF THREE KINDS OF LACTOBACILLUS ON AMMONIA PRODUCTION OF *E. COLI*. *(Jap.)* Matsuura, K. (Sch. Med. Tokushima U., Japan) *Shikoku Acta Med* 25(5):700-709, 1969.

2496 EFFECTS OF MECHANICAL INSUFFICIENCY AND INCREASED PERIPHERAL CIRCULATION IN THE MESENTERIC LYMPHATIC REGION. *(E.)* Vajda, J. (U. Med. Sch., Budapest, Hungary), E. Feher and K. Csanyi. *Acta Morph Acad Sci Hung* 17(2):95-104, 1969

2497 ARTERIAL COLLATERALS IN THE LIVER HILUS. *(E.)* Redman, H. C. (Wayne Cnty. Gen. Hosp., Eloise, Mich.) and S. R. Reuter. *Radiology* 94(3):575-579, 1970.

DIAGNOSTIC PROCEDURES

ARTERIOVENOUS MALFORMATION OF THE INTESTINE DIAGNOSED BY ANGIOGRAPHY. *(E.)*

alter, B. (Lahey Clin., Boston, Mass.), D. O.
ston and R. E. Wise. *Lahey Clin Found Bull*
):22-27, 1970.

value of angiography in the radiologic assess-
of the site of gastrointestinal bleeding is
nstrated by the presentation of two cases of
ents with occult hemorrhage in the gastrointes-
l tract, secondary to arteriovenous malforma-
. The futility of exploratory laparotomy for
lization of obscure gastrointestinal tract
ding is emphasized in both case reports. Angio-
hy is indicated in any patient in whom conven-
al barium studies and endoscopy fail to reveal
source of bleeding, or in any case with a con-
ng case history which fails to support the
er diagnosis.

PROCTOSIGMOIDOSCOPIC EXAMINATIONS. *(E.)*

Swinton, N., Sr. (Lahey Clin., Boston,
.) and D. D. O'Keefe. *Lahey Clin Found Bull*
):28-33, 1970.

tosigmoidoscopic examinations are an important
of a complete physical examination, (even in
absence of gastrointestinal tract symptoms or
ious history of colonic or rectal disease) and
most effective in the early detection of rectal
inoma and of benign polyps. The procedure for
tosigmoidoscopic examination is described in
il.

INSUFFLATION OF TANTALUM POWDER INTO THE STOMACH: NEW APPROACH TO GASTROGRAPHY.

Dodds, W. J. (Marquette U. Sch. Med., Milwau-
Wisc.), H. I. Goldberg, S. Kohatsu, L. J.
rthy, J. Nadel and F. F. Zboralske. *Invest*
ol 5(1):30-34, 1970.

chnique for outlining the feline stomach roent-
graphically by insufflation of tantalum powder
tested successfully in 15 adult mongrel cats.
entire gastric mucosal surface was coated with
10 gm of powdered tantalum, and gastrograms of
quality were obtained consistently. Powdered
talum adequately coated gastric mucosa for 2 to
r in atropinized animals, and the time of gastric
tying was not increased when the animals were
sthetized. Tantalum gastrograms readily demon-
ated experimentally produced masses, and the
hnique may prove useful for diagnosing gastric
ions in man.

1 THE AUSTRALIA HEPATITIS ANTIGEN IN THE DIAGNOSIS OF VIRUS HEPATITIS. *(It.)* Del

te, S. (Med. Clin. U. Milan, Italy), D.
stantino, M. Doglia and A. Lorenzelli. *Minerva*
l 60(102):5195-5201, 1969.

tralia antigen levels in the serum of 87 patients
h viral hepatitis were determined by the agarose
bidimensional method of Prince. An overall
sitive result for Australia antigen occurred in
the sera of 64% of the patients with viral hepatitis (this figure increased to 93% during the first two weeks following onset of symptoms). There was no relation between serum Australia antigen levels and serum transaminase levels and positive tests for serum Australia antigen preceded any changes in serum transaminase levels and the clinical symptoms of the disease.

2502 OPERATIVE BILIARY ENDOSCOPY: EXPERIENCE WITH THE FLEXIBLE CHOLEDOCHOSCOPE IN 100 CONSECUTIVE CHOLEDOCHOLITHOTOMIES. *(E.)*

Shore, J. M. (Cedars-Sinai Med. Ctr., Los Angeles, Cal.) and E. Shore. *Ann Surg* 171(2):269-278, 1970.

The technique of operative biliary endoscopy using the flexible fiberoptic choledochoscope is described, and the endoscopic anatomy and pathology of the biliary tract are outlined. The results of biliary endoscopy in 100 patients undergoing primary choledocholithotomy are presented. The biliary tract ducts were cleared of all calculi following operative exploration, endoscopy, and completion cholangiography in 96% of the patients. Calculi retained after operation were found in 4 patients, and in none of these was the calculus demonstrated by operative cholangiography. Operative biliary endoscopy was of diagnostic value in 35% of the cases, and in 22 patients, detected calculi missed by standard operative exploration. The technique facilitated interpretation of operative cholangiograms in 7 patients. The use of biliary endoscopy did not increase the postoperative complication or mortality rate beyond that usually encountered in choledocholithotomy.

2503 RADIOLOGY OF THE BILIARY TREE. *(E.)*

Brindle, M. J. (Alexandria Hosp. Edmonton, Canada). *Appl Ther* 12(2):16-20, 1970.

Abdominal series of x-rays of the biliary tree will reveal abnormal densities due to biliary calculi and pancreatic calcification. Non-biliary densities such as renal calculi must be differentiated, and it is stressed that only 20% of biliary calculi are radio-opaque. Oral cholecystography using a single dose of three grams of iopanoic acid (Telepaque) give a 95% incidence of visualization of the gall bladder in single trials (side effects include mild diarrhea, nausea and vomiting in about 25% of the patients). This examination interferes with routine laboratory determinations for albuminuria, B.S.P., and protein-bound iodine. Intravenous cholangiography is recommended for evaluation of acute cholecystitis, or in the event of failure of the oral cholecystography method. Newer developments in the field of radiology of the biliary tree include the intravenous injection of radioactive iodinated rose bengal and other radioisotopes, ultrasonography, percutaneous transhepatic cholangiography and operative cholangiography.

2504 THE ROLE OF THE GASTROCAMERA IN DIAGNOSIS. *(E.)*

Sullivan, B. H., Jr. (VA Hosp. Cleveland, Ohio), H. B. Friedman and C. H. Brown. *Ohio Med J* 66(3):260-265, 1970.

The usefulness and accuracy of the gastrocamera in the diagnosis of gastric disease was studied in 200 patients. Fifty-two of the 56 patients with no gastric disorder were correctly diagnosed as "normal", and two were incorrectly diagnosed as being pathological. Seventy-eight patients had gastric ulcers, 37 of which were detected by gastrocamera. The gastrocamera was effective in the correct diagnosis of 12/16 cases of gastritis, 22/31 cases of malignant tumor and 12/12 patients with benign tumor. The gastrocamera aided in the correct diagnosis of 74% of the cases (140/188) examined successfully.

2505 CYSTIC DUCT CHOLANGIOGRAPHY: A SIMPLIFIED PROCEDURE. *(E.)* Alden, J. F. (St. Paul Minn.) and J. W. LaFave. *Minnesota Med* 53(1):87-89, 1970.

The routine cystic duct cholangiography procedure is described, and several compelling advantages are listed. A negative cholangiogram is more accurate in excluding common bile duct stones than a negative choledochotomy (precluding unnecessary surgery). Positive cystic duct cholangiography increased the yield of choledochotomy to 78%. Unsuspected common bile duct stones were found in 6.3% of all patients who had a cystic duct cholangiogram, but had none of the usual criteria for choledochotomy. Cholangiography provides a permanent record of the operative status of the extra-hepatic biliary ducts, and allows rapid and secure cannulation of the cystic duct.

2506 DOUBLE CONTRAST EXAMINATION OF THE SMALL INTESTINE: PRELIMARY COMMUNICATION OF A NEW TECHNIQUE. *(E.)* Pajewski, M. (Asaf Harofe Govt. Hosp., Serifin, Israel), Y. Itzchak and A. Profis. *Clin Radiol* 21(1):83-86, 1970.

A method for visualization of the small intestine using the double contrast principle was tested in 20 patients referred for gastrointestinal studies. The small intestine, containing a previously ingested opaque mixture of barium sulfate in aqueous suspension with sorbitol and sodium citrate was inflated with air, and its motility was depressed pharmacologically by Probanthin or Paragon. In 15 of the 20 cases, excellent visualization of the small intestine was obtained. In three cases, only a part of the small intestine was seen, and there were two failures.

2507 BILIARY MANOMETRY: ITS ROLE IN CLINICAL SURGERY. *(E.)* Schein, C. J. (Albert Einstein Coll. Med., New York, N.Y.) and T. C. Beneventano. *Surgery* 67(2):255-260, 1970.

The procedure of biliary manometry using saline and contrast material was performed and evaluated in 137 patients undergoing biliary tract surgical treatment. The procedure was of value in confirming the diagnosis of choledochoduodenal junction stenosis in the postcholecystectomy syndrome and to demonstrate a vagally sensitive hypertensive sphincter. As an adjunct to cholangiography, biliary manometry did not clarify the diagnosis of a dilated duct without choledochal hypertension, nor of the otherwise normal duct with choledochal hypertension.

2508 THE AVOIDANCE OF COMPLICATIONS IN BARIUM-ENEMA STUDIES. *(E.)* Fainsinger, M. H. (Framingham Union Hosp., Mass.). *Dis Colon Rectum* 13(1):31-33, 1970.

The complications of barium-enema studies are mainly partial perforations of the colonic wall (leading to barium granuloma formation), venous intravasation of barium, and tears permitting leakage into the peritoneal cavity (47% mortality). Complications are caused by anterior rectal wall abrasion by the rectal catheter, balloon catheter use in cases of rectal inflammation or colostomy, high intraluminal pressure (>24 inches) and barium enema study after sigmoidoscopy. Barium enema complication studies support the conclusion that their incidence could be substantially reduced if radiologists clearly understood the causes outlined.

2509 HEPATIC VENOGRAPHY IN HEPATIC TUMORS. *(E.)* Nakamura, T. (Tohoku U. Sch. Med., Sendai, Japan), S. Nakamura, A. A. Onodera, T. Aikawa and H. Iida. *J Tohoku Univ Sch Med* 99(3):281 288, 1969.

Hepatic venography was performed in 9 cases of primary hepatic tumors and in 17 cases of metastatic hepatic tumors in order to establish the diagnosis of hepatic tumors. The deformity of the hepatic veins due to compression by the tumors was observed in 42% of the cases and pathological anastomoses between the hepatic veins were observed in 41% of the cases of metastatic tumors, but in none of the cases of primary tumors. Vascular sack and filling defects of the sinusoidal radio-opacity appeared in 2 cases with metastatic tumors. These venographic findings were characteristic of hepatic tumors, and hepatic venography was found useful in the diagnosis of hepatic tumors.

2510 TENSION HEPATOTHORAX DIAGNOSED BY RAPID SCINTIPHOTOGRAPHY. *(E.)* Jallah, E. M. (Albert Einstein Coll. Med., Bronx Munic. Hosp. Ctr. New York, N.Y.), R. W. M. Frater and L. M. Freeman. *J Thoracic Cardiovasc Surg* 59(2):283-286, 1970.

A case of blunt trauma to the pelvis resulting in rupture of the right diaphragm, tension hepatothorax and cardiorespiratory arrest was diagnosed rapidly and early by scintiphotography. Scintiphotograph is a useful diagnostic tool; it takes less than three minutes to perform and provides a simultaneous visualization of the lung and the liver, aiding in the determination of spatial relationships. The right thoracotomy approach to cardiac rescucitation is emphasized.

2511 COMPARATIVE LIVER SCANNING: TECHNETIUM SULFIDE Tc99m VS. GOLD Au 198. *(E.)* Cantor, R. E. (Albert Einstein Med. Ctr. Northern v., Philadelphia, Pa.), E. M. Cohn, C. H. Park and Shapiro. *JAMA* 211(10):1677-1680, 1970.

ver scans were performed with both technetium sul- de Tc 99m and gold Au 198 in 48 patients with sus- cted liver metastases. In 90% of the patients 3/48) the interpretations of the sulfur colloid d gold scans were similar. In 10% (5/48) the chnetium sulfide Tc 99m scans were abnormal while e corresponding gold Au 198 scans were normal. In 1 five cases there was either histologic or strong inical and laboratory evidence of liver disease. us, approximately 10% more intrahepatic lesions re demonstrated with technetium sulfide Tc 99m an with gold Au 198. Spleen scans were easily ob- inable in 77% (37) of the patients given technetium lfide Tc 99m. In scanning for metastases, a non- lpable liver had only a 23% chance (3/13) of being normal, while a palpable liver had a 60% chance 8/30) of being abnormal.

512 A COMPARISON OF ULTRASONIC AND ISOTOPE SCANNING IN DIAGNOSIS OF LIVER DISEASE. *.)* McCarthy, C. F. (Region. Hosp., Galway, Ire- nd), E. R. Davies, P. N. T. Wells, F. G. M. Ross, H. Follett, K. M. Muir and A. E. Read. *Brit J diol* 43(506):100-109, 1970.

e relative value of isotope scanning (scintigrams, ing techniturium 99m sulfur colloid) and ultra- nic scanning in the diagnosis of liver disease, s assessed in 99 patients (23 with normal livers, with cirrhosis, 15 with tumors in the liver, 6 th obstructive jaundice, 7 with fatty livers, 5 th unspecified abnormal livers, 6 with cysts or scesses, and 10 with miscellaneous conditions). the normal group, only two patients had abnormal ans by both methods, although 10 had an abnormal sotope scan. In patients with cirrhosis, both ans were generally abnormal while in patients with mors of the liver, the tumor was detected by intogram, but was undetected in 7/15 patients by e ultrasonic scan, and was difficult to distin- ish from abnormalities produced by obstructive aundice of cirrhosis. The ultrasonic scan was ffective in distinguishing cystic from solid le- ions in the liver, but the scintiscan was not.

513 THE GASTRO-CAMERA: TECHNIQUE AND DIAGNOSTIC VALUE IN GASTRIC DISEASE. *(E.)* ouche, R. (Groote Schuur Hosp., Cape Town, Union of outh Africa), S. Bank, B. Brom, I. N. Marks, G. O. arbezat, and Z. Rubinstein. *S Afr Med J* 43(51):1545- 548, 1969.

he relative value of the gastrocamera, radiology, astroscopy and the augmented histamine test are ompared in the diagnosis of consecutive patients. n gastrophotography a miniaturized camera is used o obtain intragastric photographs of the mucosa. n 63 patients with proved gastric lesions, the ab- ormality was detected by radiology in 81%, by gas- roscopy in 76%, and by gastrocamera in 80%. The ugmented histamine test indicated the possibility f a lesion in 27%. In only 51 of the 108 patients could complete agreement of diagnosis be reached in all four tests, and in 57 cases there was nonagreement between tests. When all four tests were considered, the absolute diagnostic accuracy for proved gastric lesions was 96.8%, and for all patients investigated (with or without a gastric lesion) the accuracy was 96.3%.

2514 ENDOSCOPY AND RADIOLOGY IN THE DIAGNOSIS OF ESOPHAGO-GASTRIC HEMORRHAGE. *(E.)* Lenarduzzi, G. (Inst. Radiol. U. Padua, Italy). *Quad Radiol* 34(4):293-306, 1969.

2515 A COMPARISON BETWEEN SCINTIGRAPHY AND THE TEST WITH RECTAL RADIOACTIVE IODINE IN HEPATIC DISEASE. (*Fr.*) Lacres, R. (State U., Ghent, Belgium), W. Van Hee and L. Demeulenaere. *Acta Gastroent Belg* 32(11):840-845, 1969.

2516 ACID PERFUSION TEST FOR DIAGNOSING REFLUX ESOPHAGITIS. (*Ger.*) Keel, H. J. (U. Med. Clin., Zurich, Switzerland) and W. Blättler. *Deutsch Med Wschr* 95(1):31-33, 1970.

2517 CLINICAL DETERMINATION OF THE LACTATE-DEHYDROGENASE (LDH) CONCENTRATION IN THE GASTRIC JUICE FOR THE DIFFERENTIAL DIAGNOSIS OF MALIGNANT AND PRECANCEROUS STOMACH. (*Hun.*) Laszlo, D. (Commun. Hosp., Jaszberenyi, Hungary), P. Andras and F. I. Albert. *Orv Hetil* 110(45):2635-2640, 1969.

2518 DANGERS IN LIVER BIOPSY PUNCTURE. (*Sp.*) Galmarini, O. V. (Central Aeronaut. Hosp., Buenos Aires, Argentina). *Prensa Med Argent* 56(30): 1470-1476, 1969.

2519 USE OF THE PEPTIDE CERULEIN IN CHOLANGIO-CHOLECYSTOGRAPHY OF THE GUINEA PIG. (*It.*) Ballarini, G. (Inst. Clin. Vet. Med., U. Parma, Italy), G. Zannetti and A. Agosti. *Farmaco [Prat]* 24(12):779-784, 1969.

2520 SYMPTOMS AND ERRORS IN THE DIAGNOSIS OF CANCER OF THE COLON. (*Rus.*) Petrov, V. P. (S. M. Kirov Red Banner Order of Lenin Military Med. Acad., USSR). *Vestn Khir Grekov* 103(11):38-41, 1969.

2521 LAPAROSCOPY IN THE DIAGNOSIS OF OBSTRUCTIVE JAUNDICE. (*Pol.*) Sowa, J. (Acad. Med., Cracow, Poland). *Przegl Epidem* 23(4):501-506, 1969.

2522 PROSTIGMINE-PANCREOZYMIN TEST FOR THE DIAGNOSIS OF PANCREATIC DISEASES. (*Ser.*) Glisic, L. (Fac. Med. U. Beograd, Yugoslavia). *Srpski Arh Celok Lek* 97(4):437-441, 1969.

2523 DUODENAL BIOPSY. (*Cz.*) Kocianova, J. (ILF, Prague, Czechoslovakia), Z. Maratka, J. Kudrmann and S. Vesin. *Cesk Gastroent Vyz* 23(7):297-305, 1969.

2524 RECOGNITION OF GASTRIC METASTASES IN THE LIVER BY MEANS OF NEEDLE BIOPSY. (*Rus.*) Konovalov, N. I. (N. N. Petrov Res. Inst. Oncol., USSR Min. Publ. Hlth., Leningrad), N. P. Fadeev and N. M. Chistova. *Vop Onkol* 15(12):8-15, 1969.

2525 EVALUATION OF A STRING TEST IN NONBLEEDING INDIVIDUALS. (*E.*) Switz, D. M. (Case Western Reserve U. Sch. Med., Cleveland, Ohio) and H. P. Roth. *Gastroenterology* 58(2):185-188, 1970.

2526 INDIUM^{113m} AS A SCANNING AGENT. (*E.*) Andrews, J. T. (Royal Melbourne Hosp., Australia) and L. W. Steven. *Aust Radiol* 13(1): 114-119, 1969.

2527 CULTURE OF NEEDLE BIOPSIES OF THE LIVER FROM PATIENTS WITH SUSPECTED HEPATITIS. (*E.*) Taylor, P. E. (West Middlesex Hosp., London, England), A. J. Zuckerman and L. J. Farrow. *J Clin Path* 22(6):701-703, 1969.

2528 THE α_1-FETOPROTEIN TEST IN HEPATOCELLULAR CARCINOMA. (*E.*) Foy, H. (Wellcome Trust Res. Lab., Nairobi, Kenya), A. Kondi, C. A. Linsell, A. M. Parker and P. Sizaret. *Lancet* 1(7643):411, 1970.

2529 CORRELATION CONFERENCES IN RADIOLOGY AND PATHOLOGY. (*E.*) Finby, N. (St. Luke's Hosp. Ctr., New York, N. Y.) and C. F. Begg. *New York J Med* 70(4);552-555, 1970.

2530 OPERATIVE CHOLANGIOGRAPHY IN DIAGNOSIS OF INTRAHEPATIC ABSCESS: PRESENTATION OF A CASE. (*E.*) Alavi, S. M. (U. Virginia Sch. Med., Charlottesville) and T. E. Keats. *J Canad Ass Radiol* 20(4):253-254, 1969.

2531 PERORAL BIOPSY OF THE SMALL INTESTINE IN ADULTS: I. SPECIFIC LESIONS AND DIAGNOSIS OF ATROPHIES. (*Fr.*) Frexinos, J. (Hosp. Purpan, Toulouse, France), H. Bahsoun and A. Ribet. *Rev Med Toulouse* 5(10):847-855, 1969.

2532 SELECTIVE ABDOMINAL ARTERIOGRAPHY: SAFEGUARDS AGAINST A MISUSE OF THE TECHNIQUE. (*Fr.*) Morin, G. (Paris, France). *Arch Franc Mal Appar Dig* 58(12):817-820, 1969.

2533 A SIMPLE AND SAFER ^{113m}In COLLOID PREPARATION FOR SCANNING THE LIVER. (*E.*) Anonymous. *Int J Appl Radiat* 21(1):36-38, 1970.

2534 OUR EXPERIENCE WITH GASTROSCOPY: WITH REFERENCE TO 1200 CASES. (*Fr.*) Gaucher, P. (no affil), J. Laurent, M. Bas, P. Drouin, G. Mauuary, D. Vautrin, D. Regent, and M. Bigard. *Ann Med Nancy* 8(6):427-432, 1969.

2535 SCINTIGRAPHY AND HEPATIC FUNCTIONAL TEST WITH COLLOIDAL Au 198. (*Fr.*) Frere, A. G. (Clin. Cesar De Paepe, Brussells, Belgium), A. M. Frere-Van Haverbeke and J. Rosillon. *Acta Gastroent Belg* 32(11):846-869, 1969.

2536 PREPARATION AND CLINICAL USE OF A ^{99m}Tc-TECHNETIUM SULFUR COLLOID FOR LIVER SCANNING. (*Fr.*) Becquevort, P. A. (Inst. Med. U. Liege, Belgium). *Acta Gastroent Belg* 32(11):829-839, 1969.

2537 THE DIAGNOSTIC VALUE OF LIVER SCINTIGRAPHY. (*Fr.*) Dreze, Ch. (Clin. St. Joseph, Liege, Belgium). *Acta Gastroent Belg* 32(11):795-828, 1969.

2538 GRAPHICAL-NUMERICAL AND SUBSEQUENT NUMERICAL-GRAPHICAL TRANSCRIPTION OF INTESTINAL PRESSURE TRACINGS BY SIMPLIFIED PROCEDURES: DEFINITION OF QUANTITATIVE PARAMETERS. (*Fr.*) Besancon, F. (Hosp. Bichat, Paris, France). *Biol Gastroent* (supp. 2):181-190, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

2539 DIAGNOSIS OF TUMORAL AND PSUEDO-TUMORAL LESIONS OF THE ESO-CARDIAL REGION. (*Fr.*) Albot, G. (Coll. Med. Hosp. Paris, France) and J. Boisson. *Actualites Hepatogastroent Hotel Dieu* 5(6):A 272-A 292, 1969.

2540 FIBER-OPTIC GASTROSCOPY: A REVIEW OF 200 CONSECUTIVE CASES. (*E.*) Brom, B. (Groote Schuur Hosp., Cape Town, Union of South Africa), S. Bank, I. N. Marks and Z. Rubinstein. *S Afr Med J* 43(51):1549-1553, 1969.

2541 INTRAVENOUS VALIUM IN ENDOSCOPIES: BRONCHO- AND ESOPHAGOSCOPIES. (*Fr.*) Pannetier, A. (Thoracic Surg. Clin., Marseilles, France), R. Pons and A. Argensson. *Ann Anesth Franc* 10(4):601-605, 1969.

2542 DOUBLE CONTRAST RADIOGRAPH ON ROUTINE EXAMINATION OF THE STOMACH. (*E.*) Kawai, K. (Kyoto U. Med., Japan), H. Takeda, T. Takekoshi, F. Misaki, K. Murikami, M. Masada, M. Nishizawa, H. Hayakawa and H. Shirakabe. *Amer J Gastoent* 53(2): 147-153, 1970.

- P:Secr:Hepatobil (2466)
- D:Esoph (2543)(2551)
- D:S.Intest (2656)(2676)
- D:Stomduo (2711)(2754)
- D:Pancreas (2768)
- D:Livbil (2802)(2806)(2814)
- D:Livbil:A.V.Hep (2869)
- D:Gen (2988)
- D:Gen:Parasit (3009)

GASTROINTESTINAL DISEASES

ESOPHAGUS

43 THE MOON-SHAPED FUNDAL DEFECT OF HIATUS
HERNIA: A NEW RADIOLOGICAL SIGN—REPORT
NINE CASES. *(E.)* Kalokerinos, J. (New Castle,
w South Wales, Australia). *Aust Radiol* 13(1):
-102, 1969.

new radiological sign of diaphragmatic hernia is
scribed, consisting of a moon-shaped defect in
stric fundus immediately to the left of the cardio-
ophageal opening. Normal barium meal volumes do
t normally reveal the defect, but it is seen with
small volume of barium (25 ml) in the supine po-
tion. When the hernia is demonstrated the defect
not seen. The mechanism of production appears
be that prior to herniation, when the portion of
e fundus that is about to herniate becomes posi-
oned between the diaphragm and the remaining
ndus. Nine cases showing this radiological sign
e reported.

44 LOWER ESOPHAGEAL SPHINCTER PRESSURE AS AN
INDEX OF LOWER ESOPHAGEAL SPHINCTER
RENGTH. *(E.)* Harris, L. D. (U. Hosp., Boston,
ss.) and S. Cohen. *Gastroenterology* 58(2):157-162,
70.

wer esophageal sphincter strength (the force in
ams required to pull a 12 mm Teflon ball from the
omach through the sphincter and into the esopha-
s) was compared with sphincter pressure (mm Hg)
25 normal subjects and in 13 patients with hiatus
rnia. There was an excellent correlation between
hincter strength and pressure in normal resting
bjects and this correlation was equally good for
th spontaneous and induced changes in strength in
d among individuals. Esophageal pressure-strength
asurements carried out under fluoroscopic visual-
zation in patients with large asymptomatic sliding
iatus hernias gave the same results.

545 RELATION OF GASTROESOPHAGEAL REFLUX TO
YIELD SPHINCTER PRESSURES. *(E.)* Haddad,
. K. (VA Hosp., San Francisco, Cal.). *Gastroenter-
logy* 58(2):175-184, 1970.

sophageal motility studies (constant catheter per-
usion with simultaneous intraluminal pH measure-
ents) were conducted in 58 patients (hiatal hernia,
ncompetent lower sphincter and postvagotomy) and
ormal controls to evaluate the relation of lower
sophageal sphincter pressures to reflux. Reflux
id not occur in controls but reflux in the patient
roup was associated with sphincter pressures that
ere significantly lower than controls (13.2 ±
.7 mm Hg = control pressure gradient). Patients
ith a marked degree of reflux demonstrated lowest
phincter pressures. Variability in sphincter
ressure and configuration was observed in hiatal
ernia patients on repeat studies and the degree
f reflux was consistently related to sphincter
ressure present at that time. Relationship of
eflux to low sphincter pressure was seen in all
roups tested.

2546 ESOPHAGEAL REPLACEMENT WITH COLON IN CORROSIVE STRICTURE. *(E.)* Wai, Ng C. (no affil). *Med J Malaya* 24(1):49-57, 1969.

A pedicled colon transplant was used for total surgical replacement of the esophagus (with no operative mortality) in eight patients with corrosive strictures. Seven patients, who were unable to eat a solid diet with dilation, did so after esophagocologastrostomy and one patient had post-operative dilation to relieve dysphagia resulting from stomal adhesion. Bouginage was not considered to be a satisfactory curative procedure in this country (Malaya), where patient follow-up is difficult and frequent dilatation is impractical. When the colon is used to by-pass a strictured esophagus, it is preferable to use an isoperistaltic loop based on the left colic artery and an end-to-end or side-to-side coloesophagostomy.

2547 MANAGEMENT OF MALIGNANT ESOPHAGOBRONCHIAL FISTULA. *(E.)* Ong, G. B. (Dept. Surg. U. Hong Kong) and K. H. Kwong. *Surgery* 67(2):293-301, 1970.

Studies were made of 18 cases of malignant esophagobronchial fistula, 17 of whom received some form of surgical treatment (no treatment was possible in 1 case). Whenever the fistulous tract was between the esophagus and a pulmonary lobe, resection of the lung with esophagectomy (if possible) was carried out (7 patients). In 2 cases the fistula and the esophagus could be excised with a cuff of the bronchial wall, and the defect left in the respiratory apparatus was repaired with pericardial flap. For those cases in which no resection was possible (9 cases), a double jejunal bypass of the lesion was performed and complete relief of symptoms was possible in successful cases (8 cases). In one case a single bypass with exteriorization of the lower esophagus and cardia ended disastrously, while in 2 cases repair with pericardial flaps was unsuccessful (the failure was due to irradiation and infection).

2548 ESOPHAGEAL MOTOR MANIFESTATIONS IN DIABETES MELLITUS. *(E.)* Vela, A. R. (Louisiana St. U. Sch. Med., New Orleans) and L. A. Balart. *Amer J Surg* 119(1):21-26, 1970.

Manometric examination (intraesophageal pressure changes) of the esophagus revealed significant alteration in motor function in 24/25 patients (age 20 to 69 yr) with diabetes. Prominent sites of functional motor disturbances involved the gastroesophageal sphincter and thoracic and cervical esophageal segments (pharyngeal involvement was infrequent). Characteristic motor manifestations included decreased tonicity and impaired relaxation of the gastroesophageal sphincter on swallowing, simultaneous segmental contractions in thoracic esophagus, and weakened or absent primary peristalsis in the cervical esophagus. No correlation existed between the high incidence of esophageal dysfunction and patient's symptoms, age, or onset of duration of diabetes. Alteration in esophageal motility seemingly is the result of vagal neuropathy in the esophagus secondary to diabetes affecting perhaps striated and eventually the smooth muscular section of the esophagus.

2549 HISTOLOGICAL CONSEQUENCES OF GASTROESOPHAGEAL REFLUX IN MAN. *(E.)* Pope, C. E., II (VA Hosp., Seattle, Wash.), F. Ismail-Beigi and P. F. Horton. *Gastroenterology* 58(2):163-174, 1970.

The histology of normal esophageal mucosa and esophageal mucosa in the presence of gastroesophageal reflux was studied in 21 healthy subjects and 33 patients with heartburn and other symptoms of esophagitis. Normal esophageal suction biopsy specimens were characterized by a thin-layer basal zone (less than 15% of the total epithelium thickness) with a few layers of basophilic cells and papillae extended less than two-thirds of the distance to the epithelial surface. Pathologic biopsy specimens were characterized by a basal zone made up of 80% or more of the total peripheral thickness, by a very thin stratified zone, and by papillae which reached the epithelial surface. Characteristic features of basal cell hyperplasia and papillae close to the epithelial surface were present in 85% of the 33 patients with gastroesophageal reflux and in only 10% of the 21 healthy subjects. There was a positive correlation between histologic features, clinical symptoms, acid reflux studies, and esophagoscopy. The proximity of the papillae to the epithelial surface suggests a possible mechanism for heartburn production.

2550 CLOSURE OF PHARYNGOESOPHAGEAL FISTULAS AND PHARYNGOESOPHAGOSTOMAS IN PATIENTS AFTER EXTIRPATION OF THE LARYNX FOR CANCER. *(Rus.)* Tsiganov, A. I. (Otolaryngology Res. Inst., Kiev, USSR). *Zh Ushn Nos Gorl Bolez* 29(6):83-89, 1969.

2551 COMBINED BRONCHOESOPHAGEAL INVESTIGATION IN CANCER OF THE ESOPHAGUS. *(Rus.)* Krolevets, I. P. (Med. Inst., Omsk, USSR). *Khirurgiia* 45(11):45-47, 1969.

2552 PROPHYLAXIS OF REFLUX ESOPHAGITIS. *(Rus.)* Voronov, A. A. (Med. Training Inst., Kiev, USSR) and V. Z. Sheiko. *Vestn Khir Grekov* 103(11):30-34, 1969.

2553 TREATMENT OF ESOPHAGEAL CANCER BY COLCHAMINE. *(Rus.)* Vitkin, B. S. (First October Distr. Hosp., Leningrad, USSR). *Vop Onkol* 15(11):90-92, 1969.

2554 HYPERMOTILE FORMS OF FUNCTIONAL ESOPHAGEAL STENOSIS. *(Ger.)* Niemann, H. (Radiol. Clin., U. Gottingen, Germany), G. Jakob and H. Schmidt. *Deutsch Med Wschr* 95(1):7-12, 1970.

2555 ESOPHAGEAL AND PEPTIC ULCERS AS THE CAUSE OF STENOSIS OF THE LOWER PART OF THE ESOPHAGUS. *(Ser.)* Jovanovic, B. V. (Fac. Med. U. Beograd, Yugoslavia. *Srpski Arh Celok Lek* 97(4): 405-413, 1969.

2556 SURGICAL TREATMENT OF MASSIVE HEMORRHAGES OF ESOPHAGEAL VARICES BY THE WALKER OPERATION. *(Sp.)* Lopez y Lopez, R. (Fac. Med. U. El Salvador, San Salvador) and G. R. Pacas. *Arch Col Med El Salvador* 22(2):140-145, 1969.

2557 SURGERY FOR HIATUS HERNIA: IS VAGOTOMY RATIONAL? *(E.)* Marchand, P. (Johannesbur Hosp., Union South Africa). *S Afr Med J* 44(2):35-39 1970.

2558 HIGH ESOPHAGEAL STRICTURE WITH HIATAL HERNIA AND A LOWER ESOPHAGUS LINED BY COLUMNAR EPITHELIUM. *(E.)* Corrin, B. (St. Thomas Hosp., London), G. K. Harrison and H.R.M. Johnson. *Thorax* 25(1):89-90, 1970.

2559 MEAT IMPACTION OF THE ESOPHAGUS. *(E.)* Hargrove, M. D., Jr. (Louisiana St. U. Sch. Med., Shreveport) and H. W. Boyce, Jr. *Arch Intern Med* 125(2):277-281, 1970.

2560 PRECIPITATION OF CONTRAST MEDIUM CAUSING IMPACTION OF SENGSTAKEN-BLAKEMORE ESOPHAGEAL TUBE. *(E.)* Hugh, T. B. (St. Vincent's Hosp., Sydney, Australia), W. R. Hennesey, B. W. Gunner, T. J. Hanks and G. M. Eckert. *Med J Aust* 57(2):60-61, 1970.

2561 SURGICAL TREATMENT OF CANCER OF THE ESOPHAGUS. *(E.)* Lortat-Jacob, J. L. (Beaujon Hosp., Paris-Clichy, France), C. A. Richard, F. Fekete and B. Launois. *Brit J Clin Pract* 24(1):13-16, 1970.

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2563 ESOPHAGEAL DYSFUNCTION. *(E.)* Lorber, S. H. (Temple U. Sch. Med., Philadelphia, Pa.). *J Saint Barnabas Med Cent* 7(1):23-25, 1970.

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;66 PITFALLS IN THE SURGICAL MANAGEMENT OF CARCINOMA OF THE ESOPHAGUS. (*E.*) Scanlon, . F. (Evanston Hosp., Ill.). *Surg Clin N Amer*)(1):75-80, 1970.

567 ACQUIRED SHORT ESOPHAGUS WITH STRICTURE. (*E.*) Menguy, R. (Dept. Surg., U. hicago, Ill.). *Surg Clin N Amer* 50(1):45-55, 1970.

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2573 TREATMENT OF RECURRENT HIATAL HERNIA. (*Fr.*) Perrotin, J. (Hosp. Lariboisiere, Paris, France). *Actualites Hepatogastroent Hotel Dieu* 5(6):A 261-A 270, 1969.

574 RECURRENT HIATAL HERNIAS: CLINICAL AND RADIOLOGIC SYMPTOMS. (*Fr.*) Crismer, R. (Med. Ctr. Beauragard, Liege, Belgium). *Actualites Hepatogastroent Hotel Dieu* 5(6):A 251-A 260, 1969.

2575 ECTOPIC GASTRIC MUCOSA IN THE ESOPHAGUS: SIGNIFICANCE, HISTOGENESIS AND COMPLICATIONS. (*Fr.*) Henrot, M. (no affil), Cl. Nandrup, J. Auriat and J. Guionie. *Ann Otolaryng* 86(12):724-732, 1969.

2576 SURGICAL TREATMENT OF ESOPHAGEAL FOREIGN BODIES AND PERFORATIONS. (*Ger.*) Barna, L. (Med. U., Budapest, Hungary), I. Sitkery and B. Sulyok. *Acta Chir Acad Sci Hung* 10(3):277-286, 1969.

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2579 MOUSSEAU-BARBIN'S PROBES IN PALLIATIVE THERAPY OF INOPERABLE ESOPHAGEAL NEOPLASMS. *(It.)* De Cecco, L. (Inst. Path. Surg., U. Padua, Italy), J. Dekleva, F. Caminiti and R. Domeniconi. *Chir Ital* 20(5):1031-1047, 1968.

- Diagproc (2516)(2539)(2541)
- D:Livbil (2816)
- D:Livbil:Cirrh (2903)
- D:Gen (2944)
- D:Gen:Parasit (3013)

2580 THE INCIDENCE OF LACTASE DEFICIENCY FOLLOWING PARTIAL GASTRECTOMY. *(E.)*

McDonald, G. S. A. (Dept. Clin. Med. Biochem., Trinity Coll., Dublin, Ireland), E. Willoughby and D. G. Weir. *Irish J Med Sci* 2(10):481-488, 1969.

Lactase deficiency in 33 postoperative partial gastrectomy patients (benign peptic ulceration) was compared with 16 normal controls, 2 months to 17 yr after operation. After jejunal biopsy, disaccharide enzyme activity was measured and histological preparations were made for each subject. Standard lactose tolerance tests were performed on fasting subjects and a history of milk intolerance and amount of milk consumed per day was obtained. Five of the 33 gastrectomy patients complained of milk intolerance (15%), but this was not present in any of the control subjects. Lactase deficiency was found in only one subject following gastrectomy and in one control. The histological findings were reported normal in both groups. The mean lactase activity in the partial gastrectomy group was 90.0 units and in the control group was 61.5 units. The difference is not statistically significant, $(0.1>P>0.05)$.

2581 LATE METABOLIC SEQUELAE OF VAGOTOMY AND GASTROENTEROSTOMY. *(E.)*

Wheldon, E. J. (Dept. Surg., U. Newcastle-upon-Tyne, England), C. W. Venables and I. D. A. Johnston. *Lancet* 1(7644):437-440, 1970.

The nutritional state of 255 patients (230 men) was investigated more than 15 yr after vagotomy and gastroenterostomy for duodenal ulceration. Weight-loss of more than 6 kg was observed in 32.5% of men and 60% of women and the difference between dietary intake and requirements was significant ($p<0.001$) (suggesting that weight-loss was a reflection of inadequate dietary intake). There was a statistically significant relation ($p<0.01$) between weight-loss and increase in bowel habits greater than 3 times the preoperative level. Hemoglobin levels below 90% were found in 43.5% of men, and below 80% in 84% of women; this anemia was the iron deficient type and no relation was found between anemia and changes in bowel habit (either episodic diarrhea or increased bowel frequency) or weight-loss. Metabolic complications appeared to be more common in women than in men. No radiological evidence of osteomalacia was observed and 4% of patients had a calcium level below 8.5 mg per 100 ml and 6.3% had a raised alkaline-phosphatase level. There was a high incidence of pulmonary tuberculosis (7%) (3 times greater than that found in the local population (2.2%)). Vagotomy and drainage seemingly may interfere with resistance to pulmonary tuberculosis after gastrectomy and to the development of clinical undernutrition after gastric surgery.

2582 ULTRASTRUCTURE OF VARIOUS METAPLASIAS OF THE STOMACH. *(E.)*

Tarpila, S. (2nd Dept. Med., U. Helsinki, Finland), A. Telkka and M. Siurala. *Acta Path Microbiol Scand* 77(2):187-195, 1969.

Electron microscopy of intestinal (8 patients) and pseudopyloric (5 patients) metaplasia of the stomach, and of the normal antral, body and jejunal mucosa showed that normal antral tubules contained cells resembling normal surface and foveolar cells of the body mucosa, cells similar to normal jejunal absorptive cells, cells resembling mucous neck cells of the body mucosa, and cells with some characteristics of parietal cells corresponding to the white parietal cells described by Lillibridge. Goblet cells were not seen. Pseudopyloric metaplasia of the body mucosa contained the same types of cells as normal antral epithelium however, parietal-like cells were lacking and the remaining cell types were less well identified with normal intestinal cells and cells of the body mucosa than the various cells found in normal antral epithelium. Intestinal metaplasia of the body mucosa contained cells which were similar to goblet cells and absorptive cells of normal jejunal epithelium. In the more superficial parts of the tubules cells were present which resembled superficial cells and others which resembled mucous neck cells of the body.

2583 MUSCLE WATER AND ELECTROLYTES IN PYLORIC STENOSIS. *(E.)*

Graham, J. A. (U. Dept. Surg., Glasgow, Scotland). *Lancet* 1(7643):386-391, 1970.

The water and electrolyte (sodium, potassium, chloride) contents of skeletal muscle biopsy specimens were compared in 18 patients with pyloric stenosis and 29 normal subjects (patients were divided into subacute, acute and chronic groups on the basis of clinical findings and serum-electrolyte abnormalities). Changes in the chronic and subacute pyloric stenosis groups were slight and consisted of an increase in extracellular water and electrolytes and a decrease in intracellular water and potassium (findings are typical of "starvation"). In the acute pyloric stenosis group, biopsy specimen extracellular water content was reduced but intracellular water was increased (mean sodium and chloride contents were reduced by 42% and 51% respectively, but potassium content was normal). Repeat biopsies carried out in 2 patients after resuscitation showed normal sodium and chloride content following treatment, while potassium content was unchanged. Balance studies indicated that actual fluid deficit was much less than clinical evidence suggested and potassium deficit was more common in patients with a long history of chronic symptoms. In most cases of pyloric stenosis, it may be necessary to replace sodium loss occurring during treatment, but potassium should be given in greater amounts where chronicity would suggest serious deficit.

2584 THE INFLUENCE OF THERMAL BURNS ON GASTRIC ACID SECRETION. *(E.)*

O'Neill, J. A., Jr. (Louisiana St. U. Sch. Med., New Orleans). *Surgery* 67(2):267-271, 1970.

Influence of thermal burns on gastric acid secretion was studied in dogs with isolated innervated (Pavlov) and denervated (Heidenhain) gastric pouches and noc-

ırnal gastric secretory output was investigated in
4 patients with burns of varying intensity. Pa-
ients with sepsis, history of Curling's ulcer, and
ıspected of current gastrointestinal bleeding were
ıcluded. Gastric-pouch animals did not respond
ɔ burn injury with hypersecretion; instead, the
endency of animals with innervated pouches was
ɔward hyposecretion, especially in stimulated secre-
ɔry studies. Burned patients, even those with
ırling's ulcer, did not show acid hypersecretion.
ıalysis of secretion patterns in 14 patients with-
ıt ulcers and 20 patients with ulcers, showed that
ıere was a tendency toward higher secretory levels
ı the ulcer group; however, most determinations
ere within normal ranges (upper limit of normal is
3mEq. of free acid in 12 hr). Relative hyperacidity
eemingly may be present on the basis of decrease in
ıstric mucus present. (Possible deficit in mucus
rotective layer of patient's with Curling's ulcers.)

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MEGADUODENUM SYNDROME WITH PRIMARY DE-
NERATION OF DUODENAL MUSCLE LAYERS. (*E.*)
olnerod, O. K. (U. Hosp., Oslo, Norway) and T.
uge. *Z Kinder Chir* 8(1-2):53-62, 1970.

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(*E.*) Isdale, J. M. (Johannesburg Gen.
sp., Union of South Africa). *Brit J Radiol*
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87 MOTOR AND SECRETORY FUNCTION OF THE STOM-
ACH IN PATIENTS WITH TOXIC GOITER BEFORE
D AFTER SURGERY. (*Rus.*) Sorokin, G. A. (Highway
sp., Odessa, USSR). *Khirurgiia* 45(11):36-39,
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RESECTION WITH DIRECT GASTRODUODENOSTOMY.
us.) Pilip, A. M. (Distr. Hosp., Zaporozhe, USSR).
irurgiia 45(11):51-55, 1969.

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BLOOD SERUM PROTEINS IN STOMACH CANCER.
us.) Gnatyshak, A. I. (Med. Inst., Lvov, USSR)
F. Sukhomlinov, M. T. Kordoba and V. R. Savran.
p Onkol 15(11):28-32, 1969.

90 PROBLEMS IN THE TREATMENT OF PATIENTS
WITH CHRONIC GASTRITIS WITH ANKAVAN NATURAL
ERAPEUTIC WATER. (*Rus.*) Shmavonyan, D. M. (no
fil.). *Ter Arkh* 41(11):99-103, 1969.

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ALCOHOLISM IN PULMONARY TUBERCULOSIS.
er.) Brugger, E. (Med. U. Clin., Würzburg,
rmany) and H. Braun. *Med Welt* 20(51):2764-2768,
69.

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2597 FUNCTIONAL AND MORPHOLOGICAL CHANGES IN THE SMALL INTESTINE AFTER GASTRECTOMY. (*Cz.*) Beno, L. (Nat. Nutr. Inst., Bratislava, Czechoslovakia), A. Bucko, V. Makovicky, J. Babala and V. Chorvatova. *Cesk Gastroent Vyz* 23(7):322-328, 1969.

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2601 DUODENAL OBSTRUCTION FROM ABDOMINAL AORTIC ANEURYSM. (*E.*) Panaro, V. A. (St. U. New York, Buffalo Med. Sch.) and M. J. Melzer. *New York J Med* 70(5):673-676, 1970.

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2603 EOSINOPHILIC GRANULOMA OF THE STOMACH: CLINICO-PATHOLOGICAL REPORT AND FOLLOW-UP OF TWO CASES. (*E.*) Eidelman, A. (Asaf Harofe Govt. Hosp., Zrifin, Israel). *Digestion* 2(5):272-281, 1969.

2604 LACTOSE MALABSORPTION AFTER GASTRIC SURGERY. (*E.*) Gudmand-Hoyer, E. (U. Hosp., Copenhagen, Denmark). *Digestion* 2(5):289-297, 1969.

2605 A WATERBORNE OUTBREAK OF GASTROENTERITIS IN WESTERN NEW YORK STATE. (*E.*) Borden, H. H. (Nat. Ctr. Chronic Dis. Control, Erie County Hlth. Dept., Buffalo, New York), R. W. Harris and W. E. Mosher. *Amer J Public Health* 60(2):283-288, 1970.

2606 FREE AMINO ACID PATTERNS OF SERUM OF PATIENTS WITH GASTRIC CANCER, ESPECIALLY ON THEIR CONTROL BY INFUSIONS OF AMINO ACID SOLUTION: EFFECT OF INFUSION OF AMINO ACID MIXTURE ON PLASMA FREE AMINO ACIDS FOLLOWING GASTRECTOMY. (*E.*) Fukui, S. (Sapporo Med. Coll., Japan). *Sapporo Med J* 35(1-2):39-66, 1969.

2607 POLYPOID HAMARTOMAS OF BRUNNER'S GLANDS: REPORT OF SIX SURGICAL CASES. (*E.*) ReMine, W. H. (Mayo Clin., Rochester, Minnesota), P. W. Brown, Jr., M.M.R. Gomes and E. G. Harrison, Jr. *Arch Surg* 100(3):313-316, 1970.

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2610 RADIOLOGICAL ASSESSMENT OF A NEW TECHNIQUE OF PYLOROPLASTY. (*E.*) Ghosh, B. B. (Nilratan Sircar Med. Coll., Calcutta, India), R. Bhattacharyar and S. K. Chatterjee. *Indian J Radiol* 23(3):135-142, 1969.

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2617 DUODENAL OCCLUSION IN THE NEWBORN. (*Fr.*) Juskiewenski, S. (Hosp. Purpan, Toulouse, France), P. Bacque, B. Petel, P. Vaysse, M. Bardier and M. Pasquie. *Rev Med Toulouse* 5(10):833-845, 1969.

2618 GASTROPATHY WITH PROTEIN LOSS. (*Fr.*) Bernades, P. (Hosp. Bichat, Paris, France and P. Zeitoun. *Rev Med* 10(29):1901-1906, 1969.

2619 TREATMENT OF GASTRITIS. (*Fr.*) Vilardell, F. (Hosp. Santa Cruz San Pablo, Barcelona Spain). *Rev Med* 10(29):1909-1915, 1969.

2620 CHRONIC GASTRITIS AND GASTRIC ANTIBODIES. (*Fr.*) Te Velde, K. (St. Gertrude Hosp., Deventer, Netherlands), G.J.P.A. Anders and H. O. Niewag. *Rev Med* 10(29):1895-1898, 1969.

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(*Fr.*) De La Pierre, M. (Inst. Clin. Med.
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6 RESULTS OF THE CLINICAL TREATMENT OF
GASTRIC AND DUODENAL ULCERS. (*Por.*)
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TERTHUR. (*Ger.*) Dimakakos, P. B. (Canton Hosp.
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S. (Dept. Med. Queen's U., Kingston, Ontario,
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IN POSTGASTRECTOMY PATIENTS. (*It.*)
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0 POSSIBLE ALLERGIC PATHOGENESIS OF GASTRO-
DUODENAL ULCER. (*It.*) Giani, E. (Central
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V. Anardi. *Osped Ital Chir* 21(1):49-59, 1969.

P:Absorp (2329)
P:Secr:Stom (2380)
Diagproc (2513)(2517)(2524)(2534)
D:Esoph (2545)(2575)
D:Stomduo:Peptulc (2632)
D:S.Intest (2656)
D:Livbil (2816)(2831)
D:Livbil:A.Nonv.Hep (2863)
D:Livbil:Cirrh (2903)
D:Gen (2944)

2631 THE RESTRAINT WHEEL: GASTRIC ULCER INDUCED THROUGH FORCED ACTIVITY IN THE RAT. *(Fr.)* Dubrasquet, M. (Hosp. Bichat, Paris, France), M. Lewin and S. Bonfils. *Biol Gastroent* (supp. 2):199-206, 1969 of *Arch Franc Mal Appar Dig* 58(10-11), 1969.

Rats (fed ad libitum and immobilized in a housing area of 350-525 cm^3) were forced to walk on a restraint wheel (provided with a program system alternating periods of rotation and rest) which turned at 2 cycles/min. Periods of forced activity ranged from 5 to 50 min/hr. Immobility appeared to be the main factor in the production of gastric ulcers in these rats however ulcer production increased in parallel with the duration of forced activity. The restraint wheel allows an analysis of the relative effects and the interrelations between two kinds of stimuli (immobility and space restriction) and reflects the conflict between the natural animal tendencies and exogenous stimuli.

2632 THERAPEUTIC CONSEQUENCES OF POSTOPERATIVE GASTRODUODENAL ACUTE HEMORRHAGE FROM STRESS ULCERS. *(Ger.)* Konrad, R. M. (U. Surg. Clin., Dusseldorf, Germany) and V. Berndt. *Helvetia Chir Acta* 36(6):594-606, 1969.

Gastrointestinal bleeding due to stress ulcer may occur in 3% of patients following cardiovascular surgery and may reach 7% after surgery of isthmus stenosis. Among 282 patients with postsurgical upper abdominal conditions, 182 had acute hemorrhage due to stress ulcers and surgery was usually performed in cases where more than 2500 ml of blood transfusion was needed. Both conservative and surgical therapeutic failure increased with the age of the patient and with the amount of blood transfusion. Fatalities occurred in 30% of the cases (only 17% in patients below 20 yr of age, 28% in patients between 21 and 50 yr of age and reached 72% in patients over 51 yr of age).

2633 FLUORESCENCE AND ULTRASTRUCTURAL FEATURES OF AMINE-STORING CELLS IN THE HUMAN GASTRIC MUCOSA. *(E.)* Penttila, H. (U. Central Hosp., Helsinki, Finland), O. Alfthan and J. Hirvonen. *Ann Med Exp Biol Fenn* 47(4):275-284, 1969.

Pyloric and midcorpus gastric specimens obtained in operations on 10 patients with gastric ulcer, 3 with duodenal ulcer, and 1 with gastric cancer were used to study (light, fluorescence and electron microscopy) the ultrastructural features of cells studded with highly osmiophilic granules and also the histochemical location of 5-hydroxytryptamine and histamine. Several cell types studded with granules typical of those known to store biogenic monoamines were found in the gastric mucosa. Cell profile, glandular location, granule architecture, and affinity of the cytoplasmic organelles and ground matrix for osmium tetroxide within gastric glands were used to classify 3 cell types. Two main granular cell types in the interstitial tissue were classified by their granule number and profiles. Toluidine blue staining of epoxy sections showed that both of these granular interstitial cell types were stained purplis blue, indicating atypical mast cells. Enterochromaffin cells were the only cells containing 5-hydroxytryptamine; principally 2 different fluorescent intraglandular 5-hydroxytryptamine-containing cell profiles were seen. In the o-phthaldialdehyde reaction histamine was located only in the in interstitial mucosal mast cells.

2634 CLINICAL EXPERIENCES WITH BASOFER. *(Ger.)* Ruhbach, W. (Johanniter Hosp., Gronau, Germany). *Deutsch Med J* 20(21):660-662, 1969.

2635 POTENTIATION BY β-ADRENOLYTICS OF THE ATROPINE ACTION ON THE BASAL SECRETION OF THE STOMACH IN PATIENTS WITH DUODENAL ULCER. *(Rus.)* Anshelevich, Yu.V. (Med. Inst., Rizhsk, USSR) and K. V. Okun. *Ter Arkh* 41(11):80-82, 1969.

2636 DUODENAL ULCER SURGERY. *(Hun.)* Laszlo, P. (Community Hosp., Komlo, Hungary), L. Andra and K. Erno. *Orv Hetil* 110(43):2505-2510, 1969.

2637 HEMORRHAGE ARISING FROM A GASTRIC ULCER PENETRATING TO THE HILUS LIENIS. *(Pol.)* Dabrowski, A. (J. Sniadecki Prov. Hosp., Bialystok, Poland) and E. Szelachowska. *Pol Prezgl Chir* 41(11):1532-1533, 1969.

2638 GASTRIC AND DUODENAL ULCER IN PATIENTS MORE THAN 60 YEARS OLD. *(Pol.)* Dacka, E. (1st Clin. Surg., Lublin, Poland), T. Spruch and T. Pochylski. *Pol Tyg Lek* 25(3):104-106, 1970.

2639 PEPTIC ULCER AND CORONARY DISEASE. *(Ser.)* Ilic, L. B. (Med. Ctr., Zajecar, Yugoslavia). *Srpski Arh Celok Lekar* 97(2):229-233, 1969.

2640 DISTURBANCES IN CALCIUM AND HISTAMINE METABOLISM IN ULCER PATIENTS. *(Rus.)* Kiseleva, A. F. (Kiev Med. Inst., USSR), T. M. Galetskaya and V. E. Kushnir. *Vrach Delo* (10):15-18, 1969.

2641 EXCRETION OF CATECHOLAMINES AND STEROID METABOLITES IN URINE IN PEPTIC ULCER. *(Rus.)* Litvinova, S. L. (Kuban Med. Inst., Krasnodar, USSR), and A. A. Fisher. *Ter Arkh* (10);109-112, 1969.

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45 THE INDICATIONS FOR SURGICAL INTERVENTION IN PEPTIC ULCER DISEASE. (*E.*) Tumen, H. J. rad. Sch. Med. U. Pennsylvania, Philadelphia). *Saint Barnabas Med Cent* 7(1):40-45, 1970.

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2654 THE EXTENT OF RESECTION IN ANTROPYLORECTOMY WITH VAGOTOMY IN PEPTIC ULCER. *(Cz.)* Langer, L. (2nd Surg. Clin., Prague, Czechoslovakia), J. Setka and P. Sebek. *Rozhl Chir* 48(11-12):541-545, 1969.

2655 ACUTE GASTRIC ULCER AFTER ABSORPTION OF POTASSIUM CHLORIDE. *(Fr.)* Leger, L. (Hosp. Cochin, Paris, France), J.P. Lenriot and G. Lemaigre. *Mem Acad Chir* 95(28-29):825-833, 1969.

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- D:Esoph (2555)
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2656 EROSION OF THE SMALL INTESTINE WITH HEMORRHAGE FOLLOWING AORTIC RESECTION: ROENTGEN FINDINGS.

(E.) Ng, E. (Sequoia Hosp., Redwood City, Calif.) and L. R. Cooperman. *Clin Radiol* 21(1):87-89, 1970.

Massive gastrointestinal bleeding is recognized as a late complication of aortic replacement surgery, and in some cases the moderate and prolonged bleeding is due to erosion and perforation of the intestinal tract by the prosthesis without an aorticoenteric fistula. The roentgen findings in this situation are specific and serve to identify the area of intestinal perforation. The prosthesis may protrude into the lumen of the intestine through the perforation, or contrast medium may extravasate through the lumen and outline the external margins of the graft. The crimped tubular pattern of the commonly used Dacron prosthesis affords positive identification.

2657 RATE OF WATER AND SODIUM ABSORPTION FROM THE JEJUNUM AFTER ABDOMINAL SURGERY IN MAN.

(E.) Shoemaker, C. P. (Yale U. Sch. Med., New Haven, Conn.) and H. K. Wright. *Amer J Surg* 119(1):62-63, 1970.

Rates of H_2O and Na absorption were measured before and after major abdominal surgery in short segments of jejunum in 5 patients (lumen catheter jejunal infusion (10 cc/min) technique). Net H_2O and Na absorption dropped from a preoperative value of 2.2 cc/min to a postoperative value of 1.2 cc/min in a 30 cm length of jejunum immediately distal to the infusion site in proximal jejunum. Net absorption was not abolished however, and infusions were well tolerated (up to 10 cc/min) except for mild cramping pain observed in 2 postoperative patients after 60 min. Jejunum motility seemingly remained intact during postoperative ileus to propel unabsorbed fluid from the infusion site to more distal jejunum to prevent local distention. Three postoperative patients tolerated intrajejunal infusion (2 cc/min for 36 hr) without adverse effects, and maintained hydration without supplemental intravenous fluid therapy. Although postoperative H_2O and Na absorption rates per unit length of jejunum are lower than normal, decrease in absorptive capacity seemingly does not affect the postoperative patients' ability to tolerate rapid intrajejunal fluid infusions.

2658 EFFECT OF *E. COLI* ON GERM-FREE AND GNOTOBIOTIC PIGS: I. LIGHT AND ELECTRON MICROSCOPY OF THE SMALL INTESTINE.

(E.) Kenworthy, R. (Unilever Res. Lab. Sharnbrook, Bedford, England). *J Comp Path* 80(1):53-63, 1970.

The response of the intestine to infection with a pathogenic stereotype of *E. coli* was studied by light and electron microscopy in germ-free and gnotobiotic pigs to provide criteria for assessment of tissues from conventional animals. An exudative inflammatory response occured in the lamina propria, and some animals died. Survivors continued to show the acute reaction histologically, despite apparent recovery. The cellular response of the lamina propria involved mainly macrophages, lymphocytes and polymorphonuclear leukocytes in the cores of the villi, and macrophages, lymphocytes and plasma cells in the intercryptal lamina. Plasma cells were not found in the villus' cores. Degenerative and necrotic changes in the tunica media of arteries and arterioles of the submucosa lead to ischemia of the adjacent villi. The nutrition of epithelial cells was severely impaired in this way and by the inflammatory reaction at their bases. They became vesiculated and/or vacuolated, showed loss of volume and could apparently be separated from the underlying villus core (though this may have been an artefact). All the major pathological changes indeed were apparently metabolic products of the organism, since microbial invasion from the gut appeared to stop at the epithelial cell.

2659 BLOOD AND GASTROINTESTINAL 5-HYDROXYTRYPTAMI CONCENTRATION AND URINARY 5-HYDROXYINDOLEACE ACID EXCRETION IN EXPERIMENTAL OBSTRUCTION OF THE SMAL INTESTINE.

(E.) Alfthan, O. (Dept. Surg., U. Helsinki Finland), M. Lempinen, O. Mustala and A. Penttila. *Ann Med Exp Biol Fenn* 47(4):285-290, 1969.

Low-grade small intestinal obstruction was produced in rats and the portal blood 5-hydroxytryptamine (5HT) content and the urinary 5-hydroxyindoleacetic acid (5HIAA) excretion after varying periods of obstruction were correlated with the changes in the total intestinal 5HT content of different parts of the gastrointestinal tract. In the first 12 hr of obstruction, the 5HT content of the whole gastrointestinal tract significantly increased both forward and distal to the obstruction and after 24 to 48 hr, the 5HT content of the gastrointestinal mucosa began to decrease, while the blood 5HT level commenced to rise. The excretion of 5HIAA at all time intervals after operation was significantly lower than during the control period and this was possibly due to the decreased renal function caused by surgery, and the 5HIAA excretion in this case illustrated the renal function rather than the 5HT metabolism. During the first hr of mechanical obstruction of the small intestine, the synthesis of 5HT in the mucosal argentaffin cell is apparently is stimulated in every part of the gastrointestinal tract and at least a part of the synthesized 5HT is probably later released into the circulation.

2660 NEONATAL INTESTINAL LIPIDOSIS IN MICE: AN INHERITED DISORDER OF THE INTESTINAL LYMPHATIC VESSELS.

(E.) Wallace, M. E. (Dept. Genetics, U. Cambridge, England) and B. M. Herbertson. *J Med Genetics* 6(4):361-375, 1969.

Preliminary genetic investigations and morbid anatomical and histological features of a new inherited disorder of the intestinal lymphatic vessels (neonatal intestinal lipidosis) are described in mice. Within 48 hr after birth, parts of the small intestine become china-white in color and portions of intestinal wall are thicker than normal and contain abundant accumulations of fat droplets, especially

n the submucosa (which in well-developed examples
ecame a broad layer composed entirely of lipid).
ne condition often persists until after weaning
nd arises as a spontaneous mutation in strain A
ice; it is dominant, with heterozygous penetrance
arying from 30-70%, according to strain. The gene
s given the symbol Nil (neonatal intestinal lipi-
osis). Breeding tests demonstrated linkage on Nil
lbinism, c, and pinkeyed dilution, p. Linkages
ere used to study the homozygous condition, the
iability of the heterozygote, and the effect of
ilk supply on penetrance. The homozygote is ante-
atally lethal with death occurring at or before
l days' gestation while heterozygote death-rate is
egligible before birth, is highest at 2-14 days,
nd diminishes after weaning. Adults are small,
ometimes infertile, and have somewhat small litters.
enetic control of neonatal intestinal lipidosis has
 superficial resemblance to chylous ascites in rag-
ed mice.

61 CONTENT OF SOME MICROELEMENTS IN THE BLOOD OF PATIENTS WITH A HISTORY OF
ALL INTESTINE RESECTION. *(Rus.)* Seniutovich,
. F. (Med. Inst. Ivan Franko, Kiev, USSR) and
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 Casale. *Gazz Int Med Chir* 74(21):1860-1867,
69.

63 INTESTINAL OCCLUSION BY RETROPERITONEAL CYSTS OF WOLFFIAN ORIGIN *(It.)* Negrone,
. (Central Hosp., Naples, Italy). *Rass Int Clin*
r 44(20):1280-1284, 1969.

64 MULTIPLE ULCERATIVE STENOTIC ENTEROPATHY. *(Sp.)* Hidalgo Huerta, M. (Francisco
anco Provincial City Sanit., Spain) and J. Muniz
nzalez. *Rev Esp Enferm Apar Dig* 29(4):545-554,
69.

65 DIVERTICULA OF THE SMALL INTESTINE. *(E.)* Mohamadi, M. (Grace Hosp., Detroit, Mich.),
 B. McIntyre. *Grace Hosp. Bull* 48(1):28-34, 1970.

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d. Res., Kuala Lumpur, Malaysia), D. S. Dhillon
d O. BinDin. *Med J Malaya* 24(1):71-73, 1969.

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d. Sch., Scotland) and D. A. D. MacLeod. *J Roy*
ll Surg Edinb 15(1):13-20, 1970.

2668 ACUTE DIVERTICULITIS OF THE TERMINAL ILEUM. *(E.)* Clements, J. L. (Emory U. Sch. Med., Atlanta, Ga.) and M. Berman. *Amer J Gastroent* 53(2):169 172, 1970.

2669 LYMPHOID HYPERPLASIA OF THE TERMINAL ILEUM ASSOCIATED WITH FAMILIAL POLYPOSIS COLI. *(E.)* Dorazio, R. A. (U.S. Army Tripler Gen. Hosp., Honolulu, Hawaii) and T. J. Whelan, Jr. *Ann Surg* 171(2):300-302, 1970.

2670 JEJUNOILEOCOLIC INTUBATION AND PLICATION FOR INTESTINAL OBSTRUCTION CAUSED BY MASSIVE ADHESIONS IN INFANCY. *(E.)* Moore, T. C. (U. California Los Angeles-Harbor Med. Ctr., Torrance, California), A. M. Salzberg and E. A. Talman. *Surgery* 67(2):364-368, 1970.

2671 PROBLEMS IN CROHN'S DISEASE. *(E.)* Palmer, W. L. (Dept. Med., U. Chicago, Ill.). *Nebraska Med J* 55(2):92-98, 1970.

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2673 SURGICAL COMPLICATIONS OF SMALL BOWEL DIVERTICULA EXCLUSIVE OF MECKEL'S. *(E.)* Miller, R. E. (St. Luke's Hosp. Ctr., New York, N.Y.), R. E. McCabe, P. F. Salomon and W. G. Knox *Ann Surg* 171(2):202-210, 1970.

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2676 MILLIPORE FILTER AS SUPPORT FOR FRESH FROZEN SECTIONS OF PERORAL BIOPSY SPECIMENS OF SMALL INTESTINE. *(E.)* Lindstrom, C. G. (Dept. Path. U. Lund, Sweden). *Acta Path Microbiol Scand* 77(3):555-556, 1969.

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2678 INTRAMURAL INTESTINAL GAS IN INFANTS: REPORT OF TWO CASES. *(E.)* Fenton, J. L. (Henry Ford Hosp., Detroit, Mich.), W. A. Reynolds and C. H. Harris. *J Canad Ass Radiol* 20(4):249-252, 1969.

2679 EXPERIENCE WITH ILEOSTOMIES: EVALUATION OF LONG-TERM REHABILITATION IN 497 PATIENTS. *(E.)* Roy, P. H. (Mayo Clin. Rochester, Minn.), W. G. Sauer, O. H. Beahrs and G. M. Farrow. *Amer J. Surg* 119(1):77-86, 1970.

2680 SURGICAL TREATMENT OF MECONIUM ILEUS. *(E.)* O'Neill, J. A. (Louisiana St. U. Med. Ctr., New Orleans), J. L. Grosfeld, E. T. Boles, Jr., and H. W. Clatworthy. *Amer J Surg* 119(1):99-105, 1970.

2681 INTESTINAL INVAGINATION RESULTING FROM BENIGN TUMOR OF THE SMALL INTESTINE: SCHWANNOMAS AND HISTOCYTOFIBROMAS. *(Fr.)* Dupuy, R. (Hosp. Beaujon, Clichy, France), J. Vallin, P. Guenin, J. M. Coldefy and J. Bernard. *Actualites Hepatogastroent Hotel Dieu* 5(6):B 269-B 276, 1969.

- P:Secr:Stom (2387)
- Diagproc (2506)(2531)
- D:Stomduo (2593)
- D:L.Intest (2705)(2756)
- D:Livbil:Gallb (2929)
- D:Gen (2943)(2945)(2948)(2950)(2996)
- D:Gen:Parasit (3008)

82 MALABSORPTION IN THE CHRONIC ALCOHOLIC. *(E.)* Roggin, G. M. (Lemeul Shattuck Hosp., ston, Mass.), F. L. Iber, R. M. H. Kater and F. bon. *Johns Hopkins Med J* 125(6):321-330, 1969.

group of 29 chronic alcoholic males (apparently ee from liver disease) was studied for evidence of stric and intestinal malabsorption. All subjects d a habitual consumption of more than 250 gm of hanol/day and were continuously drinking up to one ek prior to the study. Fecal fat and nitrogen, tamin B_{12} absorption, d-xylose and gastric acidity re evaluated. Abnormally high fecal fat excretion, ove 5 and up to 30 gm of fat/24 hr, was observed 60% of the patients. Nineteen patients (76%) monstrated an impaired absorption of d-xylose. e mean 5-hr excretion of all samples was 3.4 ± 2 gm, compared to a normal value of 5.0 gm. Im- ired absorption of vitamin B_{12} was observed in 8 tients (47%) out of the 17 tested. Twenty-seven terminations of fecal nitrogen excretion were made d fourteen (52%) showed an excretion of nitrogen eater than the upper normal limit value of 2.75 /24 hr. A state of malabsorption apparently exists the chronic non-cirrhotic alcoholic patient. enty-seven of twenty-nine patients (83%) had at ast one abnormal manifestation of intestinal nction.

33 INFLUENCE OF PARENTERAL L-ISOMERIC AMINO ACIDS ON ABSOLUTE ALBUMIN SYNTHESIS RATES TROPICAL SPRUE. *(E.)* Samuel, A. M. (Tata Mem. sp., Parel, Bombay, India), S. Jarnum and K. N. ejeebhoy. *Scand J Gastroent* 4(supp 3):51-55, 59.

e effect of parenteral administration of l-amino id infusions on nitrogen metabolism and absolute bumin synthesis rates was studied in four patients th tropical sprue complicated by steatorrhea and normal d-xylose and vitamin B_{12} absorption. All tients had abnormally low albumin synthesis rates nging from 1.8 to 4.9 mg/kg/hr. Synthesis of al- min was measured by the argenine-G-^{14}C method of cFarlane and Reeve, and the results were calcu- ted by the urine urea method. In all four patients e l-amino acid infusions of 6 gm N per day produced 2- to 3-fold rise in synthesis rate in three pa- ents, and an 8-fold rise in one patient. There s also a rise in serum albumin, total circulating bumin and total serum protein.

34 DIFFUSE PULMONARY DISEASE WITH TRANSFER DEFECT OCCURRING WITH CELIAC DISEASE. .) Hood, J. (Southampton Chest Hosp., Mass.) and M. S. Mason. *Lancet* 1(7644):445-457, 1970.

existence of diffuse pulmonary disease (with ansfer defect) and celiac disease is described in patients. The presence of rheumatoid factor and ised immunoconglutinin titers were observed in th patients following immunological studies, ile the sheep-cell agglutination test and the F 11 glutination test was positive in one patient. In- eased IgG level and impaired lymphocyte response to phytohemagglutinin occurred in one patient. Concurrence of both syndromes does not mean they are causally related and an immunological disturbance seemingly was a pathogenic factor common to both clinical syndromes.

2685 NEOMYCIN-INDUCED MALABSORPTION IN A TROPICAL POPULATION. *(E.)* Keusch, G. T. (New England Med. Ctr. Hosp., Boston, Mass.), F. J. Troncale and A. G. Plaut. *Gastroenterology* 58(2): 197-202, 1970.

The effects of neomycin on intestinal function and morphology were studied sequentially in 50 normal Thais and 19 normal American military personnel. There was diminished absorption of d-xylose and sucrose within 6 hr after a single dose of neomycin (1 to 2 gm, p.o.) and following chronic administration (1 to 8 gm per day, for 4 to 10 days, p.o.). Folic acid administration (30 mg, daily, p.o., prior to neomycin) did not alter the response to the antibiotic. Histological evidence of epithelial cell damage was present and machrophages accumulated in the lamina propria of the jejunum and contained inclusions, which were consistent with appearance of bacteria (observed changes reverted to normal following discontinuation of drug). Thais and Americans demonstrated quantitatively and qualitatively similar changes within 24 hr in the xylose tolerance test following a small dose of neomycin. The Thais jejunal morphology (which is altered) does not appear to be more sensitive to neomycin than the jejunal morphology of Americans.

2686 GLUCOSE-GALACTOSE MALABSORPTION: STUDIES ON THE INTERMEDIATE CARBOHYDRATE METABOLISM. *(E.)* Meeuwisse, G. W. (Dept. Pediat., U. Lund, Sweden) and B. Lindquist. *Acta Paediat Scand* 59(1):74-79, 1970.

Intermediate metabolism of hexoses was studied in 2 children with glucose-galactose malabsorption and 3 control children (1 with cystic fibrosis of pancreas and 2 normal). The removal rate of injected glucose was slow in children with glucose-galactose malabsorption when their diet contained limited amounts of well absorbed carbohydrate (fructose) while the half-life of injected glucose was normal when sufficient fructose was given in the diet. A fast removal rate was observed following administration of large amounts of carbohydrates prior to the intravenous glucose tolerance test (results of oral fructose tolerance tests varied with the pre-test diet in a similar manner). Fructosemia was small and independent of the diet, but blood glucose concentration reacted in a manner indicative of decreased glucose tolerance if only small amounts of absorbable carbohydrate was contained in the diet. In the infant with cystic fibrosis (initially malnourished) signs of decreased glucose tolerance were observed with an oral fructose tolerance test. The observed glucose metabolism abnormalities in patients with glucose-galactose malabsorption seemingly are unspecific for this disease and merely secondary to carbohydrate deprivation.

2687 TROPICAL SPRUE IN CHILDREN. *(E.)* Santiago-Borrero, P. J. (U. Puerto Rico Sch. Med., Caparra Heights), N. Maldonado and E. Horta. *J Pediat* 76(3):470-479, 1970.

Folic acid (5 mg 3x/day p.o.) plus vitamin B_{12} (30 ug/day for 7 days, i.m.), oxytetracycline (250 mg 4x/day for 1 month and 2x/day for 5 months, p.o.), or a 10 week gluten-free diet followed by gluten challenge and folic acid and vitamin B_{12} were given to 11 Puerto Rican children (2 to 16 yr of age) with tropical sprue characterized by chronic diarrhea, intestinal malabsorption, abnormal jejunal mucosa, megaloblastic bone marrow, and malnutrition. Partial improvement occurred in 2 patients on the gluten-free diet but mucosal abnormalities did not change (clinical symptomatology did not relapse after gluten challenge). Good improvement occurred in 6/7 patients treated with folic acid-vitamin B_{12} and excellent improvement occurred in 1 patient treated with oxytetracycline. There were rapid increases in hemoglobin concentrations and body weight and better control of diarrhea in all patients who improved on drug therapy. Six-month follow-up studies after the start of therapy showed normalization in xylose absorption in 7 children and marked improvement in 2 children and improvement in jejunal mucosa in 7 patients.

2688 JEJUNAL MUCOSA IN INFANTILE MALNUTRITION. *(E.)* Berkel, I. (Hacettepe U. Fac. Med., Ankara, Turkey), O. Kiran and B. Say. *Acta Paediat Scand* 59(1):58-64, 1970.

Histologic characteristics and disaccharidase levels (invertase, lactase, maltase) of jejunal mucosa were studied in 26 infants with malnutrition (associated with acute diseases) and in 7 controls. Jejunal mucosa in malnourished children showed mild or nonspecific histologic changes (compatible with malnutrition) such as broader and shorter villi with a tendency to branch, areas of cuboidal cells and some degree of atrophy, increased depth of crypts, increased cellular infiltration, and edema of lamina propria. In disaccharidase assays (glucose liberated from disaccharidases by hydrolases) performed in 9 patients, all had decreased (3—4 x) activities of lactase, maltase and invertase compared to controls (0.112 units/hr/mg, 0.295 units/hr/mg, and 0.166 units/hr/mg, resp.). There was no correlation between jejunal mucosal changes and anemia, hypoproteinemia, or between the severity of malnutrition and absorption tests and intestinal histology. Secondary enzyme deficiencies (improved with correction of nutritional state) seemingly may be the cause of chronic diarrheas and food intolerance in marasmic children.

2689 MALABSORPTION DUE TO PAROMOMYCIN. *(E.)* Keusch, G.T. (New England Med. Ctr. Hosp., Boston, Mass.), F.J. Troncale and R.D. Buchanan. *Arch Intern Med* 125(2):273-276, 1970.

The potential of paromomycin sulfate (Humatin, 2 gm/day, p.o. for 5 to 7 days) to induce functional and structural abnormalities of the small intestine was studied in seven healthy Thai volunteers. Urinary excretion decreased from 6.1 ± 0.5 (± 1 SE) gm/5 hr to 3.2 ± 0.5 gm/5 hr after paromomycin administration while the 2-hr serum level was significantly decreased, from 44.5 ± 4.2 mg/100 ml to 28.4 ± 4.2 mg/100 ml on day 5 of therapy (in 5 of 7 subjects), the mean maximum rise in blood glucose level (27.0 ± 11.1 mg/100 ml) was significantly lower than control level (61.1 ± 11.3 mg/100 ml). Paromomycin did not affect fecal fat excretion although abnormal fat metabolism was demonstrated histologically (steatorrhea did not occur). Structures with tinctorial and light microscope features consistent with bacteria were observed in macrophages which accumulated in the lamina propria mucosae near the villus tip of the jejunum. All effects were transient and disappeared when therapy was discontinued. Aminoglycoside antibiotic-induced malabsorption seemingly may result from the production of abnormal or functionally deficient protein.

2690 EFFECTS OF CHANGES IN DIETARY LIPIDS ON INTESTINAL FLUID LOSS IN THE SHORT-BOWEL SYNDROME. *(E.)* Bochenek, W. (Albany Med. Coll., N. Y.), J. B. Rodgers and J. A. Balint. *Ann Intern Med* 72(2):205-213, 1970.

The effect of changes in the quantity and mode of administration of dietary fat on the control of fluid and electrolyte balance, and the role of gastric hypersecretion in the pathogenesis of the short-bowel syndrome was studied in seven patients who had undergone extensive small bowel resection. Massive fecal losses of water and electrolytes were life-threatening in four patients who required repeated or constant intravenous replacement. All patients received symptomatic treatment and vitamin replacement and lowering of dietary fat, bile salt replacement and diet supplementation of micellar fat with medium chain triglycerides were effective in control of the short-bowel syndrome. A dietary regimen consisting of 50 to 75% replacement of dietary long-chain fat with medium chain triglyceride led to a gradual decline in fecal loss of water and electrolytes and a marked improvement in nutritional status. Gastric secretory studies showed minimal increases in basal and 12-hr overnight acid output in two patients, and no increase in maximal acid output. A conservative treatment program of pyloroplasty and vagotomy should be reserved for patients demonstrating massive gastric hypersecretion unresponsive to medical management.

2691 CHILDHOOD CELIAC DISEASE. *(E.)* McNicholl, B. (Reg. Hosp. U. Coll., Galway, Ireland). *J Irish Med Ass* 63(391):1-7, 1970.

2692 SERUM PROTEINS IN KWASHIORKOR: AN ANALYSIS OF 225 PATIENTS. *(E.)* Pramanik, A. K. (Christian Med. Coll. Hosp., Vellore, India), G. Jesudian and S. M. Periera. *Indian Pediat* 6(9):588-594, 1969.

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594 INTESTINAL LACTASE DEFICIENCY AND LACTOSE MALABSORPTION IN ADULTS. *(Nor.)* Fausa, O. lleval Hosp., Norway). *T Norsk Laegeforen* (3):309-312, 1970.

P:Absorp (2331)
D:Stomduo (2604)
D:Pancreas:Pancreat (2784)
D:Livbil (2803)
D:Gen (2942)(2946)

2695 COMPLETE LOSS OF THE ANUS AND RECTUM DUE TO CRUSHING INJURY TO THE PELVIS—TREATMENT USING A REVERSED ILEAL LOOP. (*E.*) Tumolo, M. A. (Brooklyn, N. Y.). *Dis Colon Rectum* 13(1):34-38, 1970.

A case is reported in which a crushing injury to the pelvis of a 15-year-old boy resulted in complete loss of the anorectum, together with the levatores ani. One month after the injury, an abdominoperineal procedure was performed to restore normal defecation via the perineum. A 12-inch loop of ileum, removed 10 inches from the ileocecal valve, was reversed in direction and mobilized so that its proximal end could be passed into the perineal wound through the floor of the pelvis and its distal end was sutured to the terminal end of the sigmoid, which previously had been freed from its pelvic floor attachment (two-layer open-type of anastomosis was used). The proximal end of the reversed loop was tacked to the perineal wound with sutures and would serve as an anus, while it was hoped that the entire reversed ileal loop would act as a sphincter to prevent involuntary escape of the feces.

2696 PROTEIN-LOSING ENTEROPATHY CAUSED BY A RETAINED INTESTINAL TUBE. *(E.)* Gruhl, V. R. (Baylor U. Med. Ctr., Dallas, Texas), H. J. Weis, J. J. Bailey and N. N. Hanks. *Gastroenterology* 58(2):217-222, 1970.

2697 CROHN'S DISEASE OF THE COLON AND DIVERTICULITIS. *(E.)* Schmidt, G. (Prince Henry's Hosp., Melbourne, Australia). *Med J Aust* 56(25):1253-1258, 1969.

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2703 PRIMARY CARCINOMA OF THE APPENDIX ASSOCIATED WITH CARCINOMA OF THE COLON: REPORT OF A CASE. *(E.)* Payumo, I. V. (French Hosp., New York, N. Y.) and J. E. McManus. *Dis Colon Rectum* 13(1):42-46, 1970.

2704 COMPLICATIONS OF SUBSTERNAL COLON INTERPOSITION. *(E.)* Mullen, D. C. (VA Hosp., Durham, N. C.), R. W. Postlethwaite and M. L. Dillon. *Amer Surg* 36(2):80-84, 1970.

2705 TUBERCULOSIS OF THE RECTUM WITH RECTO-ILEAL FISTULA: A CASE REPORT. *(E.)* Mehta, A. R. (Tata Mem. Hosp., Bombay, India). *J Postgrad Med* 15(1):45-48, 1969.

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o P:Absorp (2352)
o Diagproc (2499)(2520)
o D:Stomduo:Peptulc (2642)
o D:S.Intest (2669)
o D:Livbil:A.Nonv.Hep (2863)
o D:Gen (2950)

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D:L.Intest:Ulccol (2763)

2761 FECAL PROTEOLYSIS OF ALBUMIN AND IgG IN CROHN'S DISEASE AND ULCERATIVE COLITIS.
(E.) Soltoft, J. (U. Hosp. Copenhagen, Denmark) and S. Jarnum. *Digestion* 2(5):282-288, 1969.

Fecal proteolytic activity (estimated from the amount of radioiodine released when the fecal supernatant was incubated with ^{131}I-IgG) was measured in 12 patients with ulcerative colitis or regional enteritis (Crohn's disease), 16 patients with other gastrointestinal diseases accompanied by diarrhea, and 5 controls. In patients with ulcerative colitis or regional enteritis, proteolysis of albumin was about twice as great as that of IgG while in patients with other gastrointestinal diseases, proteolysis of albumin was less than half that of IgG. In both patient groups, fecal proteolytic activity was considerable, amounting to 23 to 84% of albumin and 21 to 74% of IgG. Fecal proteolytic activity was weak in control subjects, amounting to less than 6% for both albumin and IgG (IgG proteolysis was higher than that of albumin). Fecal proteolysis of albumin and IgG was not affected by pH of the incubation medium. Differing proteolytic pattern seemingly is due to a difference in affinity of fecal proteases to albumin and IgG.

2762 INFLUENCE OF CORTICOSTEROIDS ON THE RESULTS OF SURGICAL TREATMENT FOR ULCERATIVE COLITIS. *(E.)* Smith, A. N. (Western Gen. Hosp., Edinburgh, Scotland), K. N. Jalan, R. J. Prescott, W. Sircus, J. P. A. McManus, W. P. Small and C. W. A. Falconer. *New Eng J Med* 282(11):588-592, 1970.

The effects of corticosteroid treatment on mortality and morbidity of 140 patients undergoing surgical treatment for ulcerative colitis were examined retrospectively after separation of patients according to severity of disease; no differences in operative results, complications, duration of postoperative hospital stay, healing of the perineal wound and health status was found between steroid-treated and non-treated patients (poorer results in these categories were found with greater severity of colitis). The retrospective nature of the study did not permit examination of doses and duration of corticosteroid therapy on surgical results of ulcerative colitis. The profound effects on the immediate outcome and complication rates seemingly reflect the extreme severity of the illness in patients treated by emergency surgery.

2763 COMPARATIVE FEATURES AND COURSE OF ULCERATIVE AND GRANULOMATOUS COLITIS. *(E.)*
Glotzer, D. J. (Beth Israel Hosp., Boston, Mass.), R. C. Gardner, H. Goldman, H. R. Hinrichs, H. Rosen and L. Zetzel. *New Eng J Med* 282(11):582-587, 1970.

Comparative features and course of ulcerative and granulomatous colitis were reviewed in 95 patients with previous colonic resection for nonbacterial and nonparasitic colitis. Microscopic criteria used to separate the two forms of colitis were depth of mucosal ulceration and inflammation and presence of sinus tracts and granulomas. Diagnosis of ulcerative colitis was made in 53 patients and granulomatous colitis in 42 patients and the presence of microscopic sinuses or granulomas (or both) correlated significantly with clinical features of granulomatous colitis and their absence with clinical features of ulcerative colitis ($p<.005$) (overlap occurred in approximately one quarter of cases). There was no difference in total mortality or mortality specifically due to bowel disease between the two forms of colitis. More ileostomy revisions were required in patients with typical clinical and microscopical features of granulomatous colitis, but the long-term course following total colectomy and ileostomy was similar in both colitis forms. Morphologic and clinical distinctions between ulcerative and granulomatous colitis have been too sharply drawn and the unfavorable prognosis often attached to the granulomatous form is not warranted.

2764 CORRELATION OF THE FOLIC ACID CONTENT AND THE NATURE OF INTESTINAL MICROFLORA IN NONSPECIFIC ULCERATIVE COLITIS. *(Rus.)* Marko, O. P. (Proctol. Clin. Res. Lab. Publ. Hlth., Moscow, USSR), S. M. Bolotin and M. Kh. Levitan. *Sovet Med* (11):24-27, 1969.

2765 ULCERATIVE COLITIS: "PUZZLES WITHIN PUZZLES". *(E.)* Kirsner, J. B. (no affil) *New Eng J Med* 282(11):625-627, 1970.

2766 SINGLE STAGE PROCTOCOLECTOMY FOR SEVERE ULCERATIVE COLITIS. *(E.)* Scott, H. W. (Vanderbilt U. Med. Ctr., Nashville, Tenn.), J. E. Wimberley, H. J. Shull and D. H. Law, IV. *Amer J Surg* 119(1):87-94, 1970.

2767 ULCERATIVE COLITIS IN TURKEY: CLINICAL REVIEW OF SIXTY CASES. *(E.)* Aktan, H. (Yuksek Ihtisas Hosp., Ankara, Turkey), Z. Paykoc and A. Ertan. *Dis Colon Rectum* 13(1):62-66, 1970.

'68 EFFECT OF SECRETIN IN CELIAC AND SUPERIOR MESENTERIC ANGIOGRAPHY. *(E.)* Uden, R. (St. Gorans Hosp., Stockholm, Sweden). *Acta Radiol* (6):497-513, 1969.

ie effects of secretin in combined celiac and su- rior mesenteric angiography were investigated in) patients (ages 48 to 80 yr) for probable carci- oma of the pancreas. Secretin increased blood low through the pancreas, as well as width and con- ast density of pancreatic vessels. Reflux to the rta diminished or disappeared in 14 patients fol- wing secretin administration, while in 6 patients, differences were observed. The excellent filling both arteries and veins after secretin stimula- on made it possible to study the two vascular stems of the liver in the same examination. Car- noma and cysts of the pancreas were better demon- rated with secretin. Most patients experienced slight sensation of warmth in the epigastrium af- r secretin administration and no significant anges were observed in blood or serum diastase or blood pressure or pulse. In order to determine her effects of secretin on pancreatic blood flow, rther pancreatic angiography must be performed th with and without secretin under identical con- tions.

'69 ULTRASTRUCTURE OF CULTIVATED FIBROBLASTS IN CYSTIC FIBROSIS OF THE PANCREAS. *(E.)* anc, W. A. (Columbia-Presbyterian Med. Ctr., New rk, N.Y.), J. Bartman and U. Weismann. *J Pediat* (3):430-437, 1970.

ltivated fibroblasts from 4 patients with cyctic brosis of the pancreas and from 4 control indi- duals were investigated by light and electron croscopy. In both groups, the cytoplasmic granules ich by light microscopy were metachromatic appeared electron micrographs to consist of membrane-bound dies (lysosomes) containing a variable amount of terial compatible with ultrastructural features of ospholipids and munopolysaccharides. The only fference was quantitative: cells from patients ntained larger and more numerous lysosomes than ntrol cells. Many tissues in cyctic fibrosis parently are affected by a common defect which im- irs cell transport mechanisms and membrane per- ability and which can be enhanced in tissue culture d thus excessive amounts of metabolities would ac- mulate in the cells, stimulating lysosomal activity.

'70 CONGENITAL AMEGACARIOCYTIC THROMBOCYTOPENIA WITH FINAL PANCYTOPENIA, TRISOMY 21 AND YSTIC PANCREAS FIBROSIS. *(Ger.)* Vetrella, M. (U. hild. Clin. Marburg, Germany), W. Barthelmai and . Matsuda. *Z Kinderheilk* 107(3):210-218, 1969.

case of cystic fibrosis with severe mucoviscoido- is (diagnosis confirmed by sweat tests, absence of ancreatic enzymes in duodenal juice, and delayed econium passage) in a newborn infant is described. eath occurred after 49 days and was associated with evere diarrhea, anemia, leucopenia (520 neutro- hiles/mm^3), and a platelet count of 2000/mm^3. Post- ortem examination revealed intrahepatic bile ducts filled with mucous deposits and cholestasis, and necrotic liver cell degeneration. There was erosive enteritis of the ileum, edema in the wall of the small and large intestine, and about 40 ml of a serum-like fluid in the abdominal cavity.

2771 UNCOMMON CASES OF PANCREATIC DISEASE. *(E.)* Weber, J. M. (Brownsville Gen. Hosp., Pa.), L. J. Blumen and W. L. Wilson. *Amer J Gastroent* 53(2):132-140, 1970.

2772 THE GI EFFECTS OF PANCREATIC TUMORS. *(E.)* Zollinger, R. M. (Ohio State U. Coll. Med., Columbus). *Philadelphia Med* 66(5):219-231, 1970.

2773 ZOLLINGER-ELLISON SYNDROME AND ITS VARIANTS: ANALYSIS OF 8 CASES WITH RE- VIEW OF THE LITERATURE. *(E.)* McCormick, W. C., III (Med. Coll. Virginia, Richmond), C. M. Caravati, R. H. Armstrong, Jr., and Z. R. Vlahcevic. *Virginia Med Month* 97(2):72-85, 1970.

2774 PANCREATIC INSUFFICIENCY AND NEUTROPENIA WITH ASSOCIATED IMMUNOGLOBULIN DEFICIT. *(E.)* Hudson, E. (U. Illinois Res. Educ. Hosp., Chicago) and T. Aldor. *Arch Intern Med* 125(2):314-316, 1970.

2775 PSUEDOCYSTS OF THE PANCREAS: EXPERIENCES IN DIAGNOSIS AND TREATMENT -- A REVIEW OF 13 CASES. *(E.)* Harewood, I. H. (Howard U. Sch. Med., Washington, D.C.), LaS. D. Leffall and B. Syphan. *J Nat Med Ass* 62(1):50-59, 1970.

2776 OPERATIVE INJURIES TO THE DUCT OF SANTORINI. *(E.)* Maingot, R. (Roy. Free Hosp., London, England). *Brit J Clin Pract* 24(1):1-2, 1970.

2777 PRIMARY CANCER OF THE DIGESTIVE TRACT: V. CANCER OF THE PANCREAS. *(Sp.)* Zuniga, S. R. (Gen. Hosp., Tegucigalpa, Honduras). *Rev Med Hondurena* 36(4):310-324, 1979.

2778 MEDICAL-SURGICAL TREATMENT FOR PANCREATIC DISEASES. *(Sp.)* Oller, L. A. (Hosp. Santa Cruz, San Pablo, Barcelona, Spain) and J. M. A. Morato. *An Hosp Santa Cruz San Pablo* 29(5):407-414, 1969.

2779 PATHOGENESIS AND CLINICAL SYMPTOMS OF PSEUDOCYSTS OF THE PANCREAS AND THEIR TREATMENT. *(Ger.)* Scholze, H. (Surg. Clin. U. Munich, Germany). *Munchen Med Wschr* 112(4):135-142, 1970.

2780 THE PANCREATIC BETA CELL: DEMONSTRATION WITH PERIOXIDASE-LABELED ANTIBODY TECHNIQUE. *(E.)* Misugi, K. (Child. Hosp., Columbus, Ohio), S. L. Howell, M. H. Greider, P. E. Lary and G. D. Sorenson. *Arch Path* 89(2):97-102, 1970.

2781 OPERABILITY OF THE TOTALLY PANCREATECTOMIZED PATIENT. *(Ger.)* Kern, E. (Munich Hosp., Lörrach, Germany), K. Beck and R. Zwirner. *Med Klin* 65(1):21-24, 1970.

2782 COMPLETE AND INCOMPLETE ANNULAR PANCREAS. *(Sp.)* Olavarrieta, L. (Hosp. Prov., Valencia, Spain) and B. Narbona. *Med Espanola* 62(365):149-151, 1969.

2783 A CASE OF RUPTURE OF THE PANCREAS DUE TO TRAUMA TO THE ABDOMEN. *(It.)* Pomerri, G. (Civil Hosp., Lendinara, Italy), B. Coan, and G. P. Galassi. *Acta Chir Ital* 25(3):373-389, 1969.

- Diagproc (2522)
- D:S.Intest (2672)
- D:S.Intest:Malabs (2686)
- D:Livbil (2842)
- D:Livbil:Gallb (2914)(2931)
- D:Gen (2966)

34 NITROGEN BALANCE DURING PARENTERAL ADMIN-
ISTRATION OF RACEMIC AND 1-ISOMERIC AMINO
IDS. (*E.*) Jarnum, S. (Tata Mem. Hosp., Parel,
mbay, India), K. N. Jeejeebhoy, A. V. Borkar and
Westergaard. *Scand J Gastroent* 4(supp 3):35-39,
59.

fferences in nitrogen utilization between racemic
d 1-isomeric amino acids given i.v. were investiga-
d in a 49-yr-old man with chronic pancreatitis and
5 patients (2 men, 3 women; 21 to 39-yr-old) with
opical sprue, 2 of whom were placed on a nitrogen-
or diet throughout the study (concluded with a
riod of high oral nitrogen intake in order to com-
re the utilization of nitrogen in amino acid in-
sion and in full diet). In the patient with
ronic pancreatitis, nitrogen utilization of 1-
ino acids and of the racemic mixture was 78% and
%, resp. In 2 of the tropical sprue patients
ceiving only 1-amino acids, nitrogen utilization
s 39% and 56%, resp., while in another patient
ceiving both 1-amino acids and the racemic mixture,
was 37% and 7%, resp. In the 2 remaining pa-
ents, nitrogen utilization was 68% and 61% resp.
r 1-amino acids, 45% and 66%, resp. for the racemic
xture, and 84% and 89%, resp., when these 2 pa-
ents were placed on a full diet. Average nitrogen
ilization for the 6 patients was 52% for 1-amino
ids, 39% for the racemic mixture and 87% when on
full diet.

35 THE LYMPHATICS, PANCREATIC ASCITES, AND
PANCREATIC INFLAMMATORY DISEASE: A NEW
ERAPY FOR PANCREATITIS. (*E.*) Dreiling, D. A.
t. Sinai Sch. Med., N. Y.). *Amer J Gastroent*
(2):119-131, 1970.

review is presented of some experimental studies
pancreatic lymphatic pathways and some clinical
servations in patients with intractable pancreatic
cites. The experimental evidence appeared to in-
cate that the lymphatic channels provide a sig-
ficant pathway for pancreatic ferments and other
tabolic products under conditions of pancreatic
flammation and/or pancreatic duct obstructions.
her clinical and theoretical considerations led
the hypothesis that lymphatic obstruction played
significant role in the pathogenesis of acute pan-
eatic inflammation, and particularly in the deve-
pment of the complication of subacute pancreati-
s, as well as intractable massive pancreatic as-
tes. Thoracic ductal decompression should be
ied as an initial approach in the therapy of these
mplications.

86 ROLE OF THE LYMPHATIC SYSTEM IN THE PATHO-
GENESIS OF INFLAMMATORY DISEASE IN THE
LIARY TRACT AND PANCREAS. (*E.*) Weiner, S. (North-
stern U. Med. Sch., Chicago, Ill.), L. Gramatica,
D. Voegle, R. L. Hauman and M. C. Anderson.
er J Surg 119(1):55-61, 1970.

e role of the lymphatic system in the passage of
flammatory products between the pancreas and bil-
ry tract was studied in healthy mongrel dogs.
India ink infused into the lymphatics of either pancreas or gallbladder passed retrograde (presumably via the paraduodenal nodes) to the other side of the system. Ink infused into pancreatic lymphatics by ductal injection appeared in lymphatics along the common bile duct and ink infused into the gallbladder lymphatics appeared in the lymphatics in interlobular spaces of the pancreas. Acute cholecystitis was produced by infusion of either lipase (4 dogs), or staphylococcus toxin (8 dogs), into the gallbladder lymphatics, while injection of lipase directly into gallbladder lumen produced a similar condition (5 dogs), (an associated acute pancreatitis was observed in most of the animals). Conversely, lipase-induced pancreatitis resulted in high incidence of acute cholecystitis. These inflammatory changes were usually increased by thoracic duct ligation. The lymphatic system seemingly may be involved in inflammatory disease transmission from one organ to another in the pancreatobiliary system.

2787 PROTEOLYTIC AND ANTIPROTEOLYTIC ACTIVITY OF THE BLOOD OF PATIENTS WITH ACUTE PANCREATITIS AND CHOLEPANCREATITIS. (*Rus.*) Akzhigitov, G. N. (I. M. Sechenov Med. Inst., Moscow, USSR) and I. A. Kargashin. *Ter Arkh* 41(11):94-98, 1969.

2788 CHRONIC PANCREATITIS. (*Ger.*) Ammann, R. (Med. U. Polyclin., Zurich, Switzerland). *Deutsch Med Wschr* 95(1):1-7, 1970.

2789 THROMBOTIC CHANGES IN MANY ORGANS IN ACUTE PANCREATITIS IN MAN. (*Pol.*) Musiatowicz, B. (Acad. Med., Bialystok, Poland), J. Popow and A. Gabryelewicz. *Pol Tyg Lek* 25(2):59-61, 1970.

2790 CONTINUOUS FLOW DRAINAGE OF THE PERITONEAL CAVITY IN ACUTE PANCREATITIS. (*Pol.*) Ziarek, S. (Acad. Med., Zabrze, Poland), J. Rokicka-Usielska and S. Szyszo. *Pol Prezgl Chir* 41(11):1487-1491, 1969.

2791 ACUTE PANCREATITIS AND MYOCARDIAL INFARCTION. (*Pol.*) Gabryelewicz, A. (Int. Dis. Clin., Bialystok, Poland), A. Stasiewiczowa, J. Popow and B. Musiatowicz. *Pol Arch Med Wewnet* 43(5):1525-1531, 1969.

2792 EVALUATION OF SERUM ALDOLASE IN PANCREATITIS. (*Ser.*) Brkic, D. (Fac. Med. U. Beograd, Yugoslavia), L. Glisic, Z. Perisic, V. Micanovic, S. Lekic and L. Dikic. *Srpski Arh Celok Lek* 97(4):425-430, 1969.

2793 PANCREATITIS IN RENAL TRANSPLANTATION. (*E.*) Johnson, W. C. (Tufts U. Sch. Med., Boston, Mass.) and D. C. Nabseth. *Ann Surg* 171(2):309-314, 1970.

2794 PANCREATITIS ASSOCIATED WITH HYPERPARATHYROIDISM. (*E.*) Battersby, C. (U. Queensland Dept. Surg., Australia), W. Burnett and J. Winch. *Med J Aust* 56(25):1268-1270, 1970.

2795 ACUTE PANCREATITIS, HYPERCALCEMIA, HYPERURICEMIA, AND HYPERTENSION SECONDARY TO PARATHYROID ADENOMA. (*E.*) Ory, E. M. (Baylor Coll. Med., Dallas, Texas), D. P. Hisey and D. E. Redmond, Jr. *Southern Med J* 63(2):194-197, 1970.

2796 CHRONIC PANCREATITIS. (*E.*) Berk, J. E. (Dept. Med. U. California, Irvine) and P. H. Guth. *Med Clin N Amer* 54(2):479-492, 1970.

2797 SURGICAL INTERVENTION IN ACUTE PANCREATITIS. (*Fr.*) Franche, O. (2nd Surg. Clin., Jasi, Rumania), N. Manecan, V. Nour and M. R. Galesanu. *Acta Chir Belg* 68(6):459-463, 1969.

2798 TRANSVERSE AXIAL STRATIGRAPHY WITH ANATOMO-RADIOLOGIC CORRELATIONS IN CHRONIC PANCREATITIS. (*Fr.*) Levrat, M. (Hosp. Eduoard Herriot, Lyon, France), E. Phelip, L. Descos, B. Moulinier and P. Bret. *Rev Int Hepat* 19(6):337-357, 1969.

9 ULTRASTRUCTURE OF THE LIVER IN WILSON'S DISEASE. *(Fr.)* Feldmann, G. (Hosp. Beau-, Clichy, France), O. Groussard and R. Fauvert. *l Gastroent* (supp. 2):137-160, 1969 of *Arch Franc Appar Dig* 58(10-11), 1969.

rastructural investigations (light and electron roscopy) of hepatocytes revealed alterations nly at the mitochondrial level in liver biopsies m 4/5 patients with Wilson's disease. The size the mitochondria were variable (30 to 150 Å) and ir structure revealed increased electron density the matrix with various inclusions and alterations the cristae and outer membranes as compared to trol samples. Fatty metamorphosis (considered a -cirrhotic phase) and lysosomal alterations were nd in the biopsies of 3 patients. Nuclear alterons with vacuolar appearance and glycogenic umulations (due to either an unknown metabolic order or to an alteration of nuclear membrane meability) were observed and are considered to unspecific for Wilson's disease. Pigment deposits pofuscins) surrounded the bile canaliculi and eared to be related to copper accumulation which urred in the cytoplasm (in the initial stages of disease) and in the lysosomes (in the latter ges).

0 SOME PROPERTIES OF CERULOPLASMIN FROM PATIENTS WITH WILSON'S DISEASE. *(E.)* rico, R. J. (Dept. Physiol. Chem., U. Wisconsin, ison) and H. F. Deutsch. *Biochem Med*):117-129, 1969.

concentration and properties of ceruloplasmin oxidase activity were studied by Ouchterlony igen-antibody reactions, starch gel electrophois and spectrometry in the sera of 15 patients h Wilson's disease. The sera contained mixtures blue and colorless ceruloplasmins which did not sess oxidase activity. Specific precipitates ained with sera from patients with normal levels ceruloplasmin were blue and sera from patients h low levels of ceruloplasmin were white. Proties of ceruloplasmin in all types of sera (blue, te) were similar to those of apoceruloplasmin were not different from the properties of cerulasmin from normal individuals.

1 ULTRASTRUCTURAL CHANGES OF THE LIVER IN PATIENTS WITH GILBERT'S DISEASE. *(Ger.)* aff, Z. (Med. U. Budapest, Hungary), K. Lapis L. Safrany. *Beitr Path Anat* 140(1):54-70, 1969.

ht-microscopy of hepatic parenchymal tissues obned by needle biopsy (Menghini) from 10 patients h Gilbert's syndrome showed no structural changes le electron-microscopy (SEM 3-1 on preparations ording to Karnovsky, 1961) revealed striking alations at the mitochondrial level with fibrillary lusions (of yet unknown nature) in their matrix. ant" mitochondria 6 to 8 μ in diameter were often erved and a marked increase in lipofuscin was n around the biliary canaliculi. The rough endosmic reticulum was considerably decreased and was characterized by a fragmentary vesicular appearance while the smooth surface reticulum was increased (probably due to the degranulation of the rough reticulum). The cytoplasmic matrix appeared overloaded with glycogenous monoparticulate granules among which ribosomes were hardly detectable and polysomes were absent and the Disse spaces were unusually enlarged. The pathologic mechanism involved in the high blood bilirubin content in Gilbert's syndrome is probably due to a disturbance in the conjugation of bilirubin with glucuronic acids.

2802 HEPATIC FLUORESCENCE IN PORPHYRIA CUTANEA TARDA STUDIED IN FINE NEEDLE ASPIRATION BIOPSY SMEARS. *(E.)* Lundvall, O. (Sahlgren's Hosp., U. Göteborg, Sweden) and L. Enerback. *J Clin Path* 22(6):704-709, 1969.

Fine needle aspiration biopsy smears from 19 patients with porphyria cutanea tarda were studied by fluorescence microscopy. Fluorescence was graded arbitrarily from 0 to 4. In all patients with manifest disease, the bright red porphyrin type fluorescence of grade 3 or 4 was seen, and in latent cases the fluorescence was of a lower grade. In patients with fluorescence of 1 or 2, the uroporphyrin excretion was at a normal or slightly increased rate (1.20 mg/day, or less); while in patients with higher grades, all levels of porphyrin excretion were observed. Of the 22 control subjects, only one showed a slight hepatic porphyrin fluorescence, and this subject was later diagnosed as a probable case of latent porphyria cutanea lata.

2803 PARATHYROID INSUFFICIENCY IN HEMOCHROMATOSIS. *(Fr.)* Vachon, A. (Hosp. Charpennes, Lyon, France), G. Vignon, B. Chatin, D. Pansu and N. C. Chapuy. *Actualites Hepatogastroent Hotel Dieu* 5(6):B 243-B 255, 1969.

The pathogenesis of hypoparathyroidism was studied in 2 patients with hemochromatosis with severe hypocalcemia (55-68 mg/l) and calcium malabsorption (excreted calcium/ingested calcium = 1.29). Clinical and histological studies revealed a combination of hemochromatosis, gonadal, pancreatic and adrenal deficiency, severe osteoporosis, and elevated blood phosphorous (80 mg/l) levels in both patients. A nuclear cataract occurred in 1 patient suggesting that hypoparathyroidism in hemochromatosis occurs as a result of calcium deficiency.

2804 PLASMAPHERESIS WITH PLASMA EXCHANGE IN HEPATIC COMA: METHODS AND RESULTS IN FIVE PATIENTS WITH ACUTE FULMINANT HEPATIC NECROSIS. *(E.)* Lepore, M. J. (St. Vincent Hosp. Med. Ctr., New York, N. Y.) and A. J. Martel. *Ann Intern Med* 72(2):165-174, 1970.

Five patients with acute fulminant hepatic necrosis and coma were exposed to massive and prolonged plasmapheresis with plasma exchange. It was expected that removal of the patient's plasma would reduce the circulating noxious protein-bound factors causing coma, and that replacement of the patient's plasma with fresh frozen human plasma would support the patient through the critical period required for hepatic regeneration. One of the 5 patients emerged from stage IV coma on the sixth day, another on the eighth day of plasmapheresis and they appeared to be recovering until bronchopneumonia developed and led to their deaths. The technique can be employed in humans without undue risk, and is more practicable than the current methods of liver by-pass in treating liver pathology.

2805 LIVER FUNCTION IN METAL WORKERS EXPOSED TO SOLVENTS. *(Ger.)* Szadkowski, D. (Inst. Workman's and and Soc. Med., U. Erlangen-Nuremberg, Germany) and M. Korber. *Int Arch Gewerbepath* 25(4): 323-337, 1969.

The possible injury to liver parenchyma in 49 workers (18 to 62 yrs old) exposed to tri- and tetrachloroethylene was studied by determination of SGOT, SGPT, serum alkaline phosphatase, total bilirubin, copper, zinc, sulfobromophthalein retention, and serum protein electrophoresis. No relation was detected between the length of occupational exposure and the appearance of any subjective complaint nor were any significant differences found between the laboratory data of the exposed subjects as compared to the control group (all mean values being contained within the normal range). Chronic alcohol use by some of the examined subjects revealed no statistical increase of pathological values in the biochemical tests. Apparently, the modern occupational environments equipped with efficient exhaustion devices prevent any clinically-detectable liver injuries in workers exposed to tri- and tetrachloroethylene.

2806 RADIOISOTOPE SCANNING IN THE PRIMARY CARCINOMA OF THE LIVER. *(E.)* Chiang, T. C. (Natl. Defense Med. Ctr., Taipei, Taiwan) and K. Y. Chen. *Int J Appl Radiat* 21(1):27-28, 1970.

A report is presented of radioisotope liver scans of 41 confirmed cases of primary hepatic carcinoma in Chinese (Taiwan) patients. Thirty-seven cases showed an enlarged liver in the scan, and the remaining four patients had a clinically palpable mass extending down from the lower surface of the liver. Tumor masses involved both lobes in 31 patients with premominating foci in the right lobe and an enlarged liver and the multiple massive cold areas on the scan were common features indicating the advanced stage of the disease. The commonly associated cirrhosis in the liver with hepatoma cannot be identified on the scan, but may be reflected by a visualized enlarged spleen which was observed in 74% of the cases.

2807 EFFECT OF AMINOPTERIN AND ANTIBIOTICS ON SACCARIDASE ACTIVITY OF THE RAT SMALL BOWEL. *(E.)* Marano, R. (Inst. Clin. Med. U. Bari, Italy), G. Pastore, O. Manghisi and O. Shiraldi. *Experientia* 25(12):1284-1285, 1970.

Intestinal disaccharidase (lactase, maltase, sucrase) activity was studied by chemical and histochemical techniques in 5 groups of rats: group 1 received 0.2 mg/kg of aminopterin for 7 days; group 2 received 0.04 mg/kg of aminopterin for 60 days; group 3 received 50 mg/kg of tetracycline or neomycin for 7 days; group 4 received 5 mg/kg of tetracycline or neomycin for 60 days; and group 5 received 2 ml of saline for 7 or 60 days. The level of all intestinal disaccharidases was decreased by 7-day treatment with aminopterin or antibiotics while only the level of lactase was decreased by 60-day treatment (especially with antibiotics). Antibiotic treatment for 7 days produced severe damage to the intestinal mucosa while antibiotic treatment for 60 days produced less severe anatomical changes.

2808 ACTION OF SCN^- ON RAT LIVER MITOCHONDRIA. *(E.)* Sachs, G. (U. Alabama Med. Ctr., Birmingham), R. H. Collier and B. I. Hirschowitz. *Proc Soc Exp Biol Med* 133(2):456-459, 1970.

Studies of the action of SCN^- on rat liver mitochondria showed respiratory control ratios of better than 8.0 with β-OH butyrate, malate, or succinate. Addition of SCN^- to mitochondria in state 3 inhibited O_2 consumption by 25% at 10mM, and 45% at 30mM when β-OH butyrate was used as the substrate. Similar results were obtained when the mitochondria were uncoupled by dinitrophenol or carbonyl cyanide m-chlorophenylhydrazone. Measurement of P/O ratios, using O_2 comsumption increments obtained upon the addition of ADP to state 4 mitochondria, showed that in the preparations a ratio of 1.6 was obtained with succinate as substrate and 2.5 with β-OH. Addition of SCN^- resulted in a slower rate of ADP-dependent O_2 comsumption, as did addition of atractylate of fluoride. The P/O ratios, calculated from the total O_2 uptake, declined slightly. Increasing the ADP/SCN ratio gradually restored the oxidation rate. SCN^- had no effect on ferrocytochrome c oxidation but succinate:$Fe(CN)_6^3$ oxidoreductase was inhibited 45%. Atrctylate reduced ADP binding by about 90%, whereas SCN^- reduced nucleotide binding, ATP more than ADP, by about 40%. SCN^- significantly slowed the uptake of K^+ induced by valiomycin, but had no effect on subsequent nigericin-induced K^+ efflux.

2809 PROTEOLYTIC ENZYMES IN ADENOCARCINOMATA OF THE HUMAN COLON. *(E.)* Goldberg, D. M. (Roy. Hosp., Sheffield, England), R. A. McAllister and A. D. Roy. *Brit J Cancer* 23(4):735-743, 1969.

Proteolytic enzyme activity (determined by hydrolysis of denatured hemoglobin at pH 3.75 and pH 6.5) was measured in adenocarcinomatous tissue of the human colon and neighboring uninvolved mucosa from the same patients. Reduced activities were found in soluble and insoluble cell fractions of tumors at both pH values and the reductions could not be related to degree of differentiation of tumor or its invasiveness as gauged by spread to neighboring lymph nodes. Proteolytic activities in uninvolved mucosa of cancer patients were decreased compared with levels found in uninvolved mucosa from patients

th inflammatory disease of the colon. The per-
ntage of homogenate activity in soluble form de-
eased at pH 3.75 and 6.5 in cancer tissue both
fore and after detergent (Nonidet P40) treatment,
lative to uninvolved mucosa from non-cancer sub-
cts; samples of uninvolved mucosa from cancer
tients were intermediate between cancer and non-
ncer subjects. Variation in proteolytic activities
normal colonic mucosa make differences difficult
define even though activity in human colonic
ncers is seemingly established.

310 THE EFFECT OF DIABETES AND INSULIN ON LIVER GLYCOGEN SYNTHESASE ACTIVATION. (*E.*) Gold,
. H. (St. Louis U. Sch. Med., Missouri). *J Biol
iem* 245(4):903-904, 1970.

311 LIVER TRANSPLANTATION. (*Heb.*) Barzilai, A. (no affil). *Harefuah* 77(11):525-526,
969.

312 GENESIS OF HEPATITIS. (*E.*) Burch, P. R. J. (Gen. Infirm. Leeds, England). *New Eng J
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970.

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P:Morph (2279)(2296)(2302)(2319)
P:Secr:Hepatobil (2422)(2450)
Diagproc (2509)(2510)(2511)(2512)(2515)(2518)
(2524)(2527)(2528)(2530)(2533)
D:S.Intest (2730)
D:Gen (2956)(2966)(2979)(2980)(3000)
D:Gen:Parasit (3012)(3018)

2856 STUDIES ON AZASERINE-INDUCED FATTY LIVER IN THE RAT. *(E.)*

Marchetti, M. (Inst. Chem Biol. Appl. Biol, U. Bologna, Italy), V. Ottani and P. Puddu. *Proc Soc Exp Biol Med* 133 (1):30-32, 1970.

The effects of azaserine administration on liver lipid composition, liver lipogenesis *in vitro*, serum lipoproteins, and liver content of ATP, biotin and nicotinamide nucleotides were studied in fasted female wistar rats. Neutral fats in the liver of azaserine-treated rats significantly increased ($P<.001$), while incorporation *in vitro* of acetate-^{14}C into total lipids decreased ($P<.001$). ATP or adenine injections apparently do not affect this behavior. Liver ATP did not show any modification following azaserine treatment whereas it is significantly increased in azaserine-treated groups injected with either ATP or adenine ($P<.001$). Under similar experimental conditions, liver concentration of biotin and nicotinamide nucleotides and serum lipoprotein levels decreased. ATP or adenine administration to azaserine-treated rats did not prevent either fatty liver development, the decrease of liver biotin and serum lipoprotein, or the decrease of acetate-^{14}C incorporation into liver lipids. Administration of ATP or adenine partially reversed the azaserine effects on liver content of nicotinamide nucleotides and increased liver concentration of ATP.

2857 XANTHOPHYLL ACCUMULATION IN LIVER STEATOSIS. *(Fr.)*

Clerc., M. (C.H.U. Abidjan, Ivory Coast), R. Loubiere, M. Ette and F. de Paillerets. *Rev Med Toulouse* 6(1):79-87, 1970.

A saffron yellow moderate hepatomegaly with massive steatosis but no fibrosis was found in a 3-year-old South African boy who died of Kwashiorkor. Serum protein content was 37 g/l and the unusual color was due to a 190,000γ/1000g liver xanthophyll content (normal levels in European boys are 60γ/1000g liver and in Africa are 900 to 1300γ/1000g liver). High liposoluble xanthophyll levels are a likely cause for fatty livers in which steatosis at an advanced stage hinders liver β-lipoprotein synthesis thus leading to an accumulation of immobilized fatty acids and triglycerides.

2858 HEPATIC INJURY IN CHRONIC HYPERVITAMINOSIS A. *(E.)*

Rubin, E. (Mt. Sinai Sch. Med., City U. New York, New York), A. L. Florman, T. Degnan and J. Diaz. *Amer J Dis Child* 119(2):132-138, 1970.

Hepatic cellular changes were studied by fluorescence and light microscopy of liver biopsy specimens from a 6-yr-old girl with hepatic dysfunction, hepasplenomegaly and hypersplenism resulting from hypervitaminosis A. Large lipid-laden Kupffer cells contained vitamin A and hepatic sinusoids contained large foamy macrophages which displayed characteristic evanescent vitamin A fluorescence (similar fluorescence was observed within hepatocytes). Lysosomes were increased, there was focal cytoplasmic degradation and numerous light and dark cells, and the smooth endoplasmic reticulum was hypertrophied. These changes are indicative of non-specific liver cell damage and seemingly may reflect intracellular release of biologically-active vitamin A alcohol.

2859 LIVER RESTITUTION AFTER ACUTE GALACTOSAMINE HEPATITIS: AUTORADIOGRAPHIC AND BIOCHEMICAL STUDIES IN RATS. *(E.)*

Lesch, R. (Inst. Path., U. Freiburg, Germany), W. Reuter, D. Keppler and K. Decker. *Exp Molec Path* 12(1):58-69, 1970.

Serum and liver glutamic oxaloacetic transaminase, glutamic pyruvic transaminase, sorbitol dehydrogenase glycogen, free glucose and glucose-6-phosphate were determined biochemically and autoradiographically in female wistar rats after induction of hepatitis by d-galactosamine (either multiple injections of 250 mg/kg or a single injection of 250 mg/kg). The peak liver glutamic oxaloacetic transaminase activity (410 uV/ml) occurred 25.5 hr after the first injection of d-galactosamine and the normal range (90 uV/ml) occurred after 90 hr. Maximum liver sorbitol dehydrogenase activity occurred 48 hr after d-galactosamine injection and was still elevated after 96 hr. Three weeks after d-galactosamine injection all enzyme activities were at normal levels. In rats receiving multiple doses of d-galactosamine, regenerative proliferation of Kupffer cells occurred after 25.5 hr, of peritoneal mesenchyme cells and bile duct epithelium after 48 hr, and of hepatocytes after 72 hr. Histologic signs of regeneration were paralelled by a return to normal of enzyme activities and liver glycogen stores.

2860 STUDY OF THE PROTECTIVE EFFECT OF THIOTANNIC ACID ON THE LIVER IN ACUTE CARBON TETRACHLORIDE POISONING. *(Pol.)*

Jaklinski, A. (Munic. Hosp., Lublin, Poland), R. Bryc, A. Jaklinsk and H. Dabski. *Pol Tyg Lek* 25(2):55-56, 1970.

2861 HEPATITIS AFTER ISONIAZID ADMINISTRATION. *(E.)*

Arthaud, J. B. (Alaska Native Med. Ctr., Anchorage) and C. E. Martin. *New Eng J Med* 282(8):433-434, 1970.

2862 ERYTHROPOIETIN ALTERATIONS IN THE PRESENCE OF DIMETHYLNITROSAMINE LIVER INJURY IN CANINE AND SIMIAN SPECIES. *(E.)*

Murphy, G. P. (Dept Biochem. Pharmacol. Urol., State U. New York Buffalo New York), E. A. Mirand, R. A. Steeves and E. C. Melby. *Invest Urol* 7(4):283-289, 1970.

2863 HEPATITIS SECONDARY TO PYRAZINAMIDE TOXICITY: ACCOMPANIEMENTS OF TRANSIENT HYPOLIPOPROTEINEMIA, ACANTHOCYTOSIS AND CHANGES IN STOMACH AND BOWEL. *(E.)*

Simpson, A. J. (Bowman Grey Sch. Med., Winston-Salem, N. C.), A. M. Mirza, J. F. Martin and T. F. O'Brien, Jr. *Southern Med J* 63(2): 138-144, 1970.

4 CHOLINE-DEFICIENCY FATTY LIVER AS A CONSEQUENCE OF LIPOPROTEIN STRUCTURE. (*E.*)
, C. E. (U. Louisville Sch. Med., Kentucky) and
S. Levy. *Biochem Med* 3(2):177-178, 1969.

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Schettler, G. (Med. U. Clin. Heidelberg,
many). *Ther Woche* 20(1):8-14, 1970.

6 CLASSIFICATION OF THE NEONATAL HEPATITIS SYNDROME. (*Dut.*) Boon, J. M. (St. Radboud
p., Nijmegen, Netherlands) and E. D. A. M.
retlen. *Nederlands T Geneesk* 114(1):4-9, 1970.

7 APLASTIC ANEMIA AFTER HEPATITIS: A CASE REPORT. (*E.*) Berkel, I. (Haceteppe U.
. Med., Ankara, Turkey). *Turk J Pediat*
2):39-44, 1969.

P:Morph (2273)
P:Absorp (2330)
Diagproc (2527)

2868 PREPARATION AND CHARACTERIZATION OF COMPLEMENT-FIXING HEPATITIS-ASSOCIATED ANTIGEN AND ANTISERUM. *(E.)* Purcell, R. H. (Natl. Inst. Hlth., Rockville, Maryland), J. L. Gerin, P. V. Holland, W. L. Cline and R. M. Chanock. *J Infect Dis* 121(2):222-226, 1970.

The preparation and serologic characterization of immunologically pure hepatitis-associated antigen and monospecific hyperimmune serum to HAA are described. Purification of hepatitis-associated antigen by double isopycnic banding in cesium chloride resulted in at least 8-fold concentration and traces of serum proteins remained associated with this antigen. Following rat zonal centrifugation in sucrose, the hepatitis-associated antigen appeared to be relatively pure but the complement fixation titer of the antigen was much lower than could be explained by dilution. Three guinea pigs inoculated with 10x immunizing hepatitis-associated antigen and 2 of 3 guinea pigs inoculated with 1x immunizing hepatitis-associated antigen developed anti-hepatitis-associated antigen as measured by complement fixation and antibody titers. Similar results were obtained in rabbits as measured by agglutinating antibody titers 13 to 14 weeks following immunization. When tested by agglutinating antibody titers, guinea pig hyperimmune serum to hepatitis-associated antigen at a dilution of 1:8 formed a precipitin line with complement fixation-hepatitis-associated antigen and 76 of 86 human sera that contained hepatitis-associated antigen, but not with 400 hepatitis-associated antigen negative sera (which included 40 sera containing anti-hepatitis-associated antigen and 9 sera from patients with hepatitis-associated antigen-negative hepatitis). The hepatitis-associated antigen-complement fixation reagents failed to fix complement with any of the virus antigens or antisera tested.

2869 EVALUATION OF SERUM ARGININOSUCCINATE LYASE (ASAL) CONCENTRATIONS AS AN INDEX TO PARENCHYMAL LIVER DISEASE. *(E.)* Campanini, R. Z. (Michael Reese Hosp. Med. Ctr., Boston, Mass.), R. A. Tapia, W. Sarnat and S. Natelson. *Clin Chem* 16(1): 44-53, 1970.

Serum concentrations of argininosuccinate lyase were determined in 122 patients with primary and secondary diseases of the liver (patients with diseases involving other organs of the body were also studied). Daily assays were made of blood concentrations of SGOT, SGPT, LDH, CPK, alkaline phosphatase, bilirubin, total and free cholesterol and the albumin to globulin ratio, and the extent of liver damage was evaluated by liver biopsy or at autopsy. In cases of viral hepatitis and other diseases of liver parenchyma the serum argininosuccinate lysate tests were more indicative of liver function than other standard liver tests (as compared with biopsy tests), and were more reproducible with a smaller margin for error. The procedure is simple and easily made routine.

2870 SUPPRESSION OF LEUKOCYTE MITOSIS BY SERA OF HEPATITIS IMPLICATED DONORS. *(E.)* Mella, B. A. (Mayo Clin. Mayo Found., Rochester, Minn.) and H. F. Taswell. *Amer J Clin Path* 53(2): 141-144, 1970.

Serum specimens from 19 donors suspected of being hepatitis carriers were incubated in cultures of normal leucocytes in a blind study. Serum from 15/19 (79%) suspect donors suppressed mitosis (based on 5 or fewer observed metaphases compared to 30 to 100 for the controls). Immunoglobulin levels (assayed by the method of Fahey and McKelvey) were increased in 11/16 (69%) suspect donors. Mitotic suppression and/or increased serum immunoglobulin levels occurred in 17/19 (89%) suspect donors. Analysis of 12 serum specimens from patients in various phases of infectious hepatitis showed that mitotic suppression occurred only in the preicteric or early icteric phase of hepatitis. Mitotic suppresion in normal leucocytes was produced by 4/23 specimens from control donors (3 of the donors had increased serum immunoglobulin levels). Mitotic suppression may result from viremia and increased immunoglobulin levels from an immune reaction to viremia.

2871 CATAMNESIC INVESTIGATIONS AFTER VIRAL HEPATITIS. *(Ger.)* Teichmann, W. (Med. Clin. U. Rostock, Germany) and G. Schroder. *Z Ges Inn Med* 24(21):749-752, 1969.

2872 EPIDEMIOLOGY OF HOMOLOGOUS SERUM HEPATITIS: POST-TRANSFUSION INFECTION IN LENINGRAD HOSPITALS. (*Rus.*) Kolganov, A. V. (Sanitary Hyg. Med. Inst., Leningrad, USSR). *Sovet Med* (11):90-95, 1969.

2873 BILIARY FLORA IN EPIDEMIC HEPATITIS. (*Rum.*) Gavrila, I. (I.M.F., Cluj, Rumania), M. Campeanu and M. Soloviev. *Microbiologica* 14(5):431-436, 1969.

2874 HEPARIN ACTIVITY OF THE BLOOD IN NONICTERIC AND ATYPICAL FORMS OF INFECTIOUS HEPATITIS. (*Rus.*) Fedenko, N. N. (Lugansk Med. Inst., USSR). *Klin Med* 47(11):74-76, 1969.

2875 IMMUNOHEMATOLOGICAL AND PHYSICOCHEMICAL CHARACTERIZATION OF THE AUTOANTIBODY IN A CASE OF AUTOIMMUNE HEMOLYTIC ANEMIA IN AN INFANT WITH VIRAL HEPATITIS. (*It.*) Armenio, L. (Inst. Clin. Pediat., U. Bari, Italy), N. V̂iolante and Ã. Ćeci. *Minerva Pediat* 21(44):2048, 1969.

2876 VIRAL HEPATITIS IN ITALY DURING 1966. (*It.*) Contro, L. (St. Charles Borromeo Hosp., Milan, Italy), L. Marangoni and B. Lomanto. *Fegato* 15(2):197-204, 1969.

2877 PROPHYLAXIS OF POST-TRANSFUSION VIRAL HEPATITIS. (*Rus.*) Kanemanaku, K. G. (Sanit. Hyg. Med. Inst., Leningrad, USSR). *Zh Mikrobiol* 46(11):70-75, 1969.

'8 FUNCTIONAL INDOCYANINE GREEN CLEARANCE IN
INFECTIOUS HEPATITIS PATIENTS. (*Ger.*)
czyk, J. (J. Strus Hosp., Poznan, Poland). *Z Ges*
Med 24(23):867-872, 1970.

'9 AUSTRALIA ANTIGEN AND HEPATITIS: STUDIES
IN ASYMPTOMATIC PEOPLE AND LEPROMATOUS
ROSY PATIENT. (*E.*) Blumberg, B. S. (Inst. Cancer
., Fox Chase, Philadelphia, Pa.) and L. Melartin.
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HEPATITIS. (*E.*) Pelikan, V. (Olomouc,
echoslovakia), V. Seidlova, J. Tichy, H. Vaverkova
l V. Jezdinska. *Rev Int Hepat* 19(6):407-416, 1969.

31 VIRAL HEPATITIS IN SUBHUMAN PRIMATES AND
ITS RELATIONSHIP TO HUMAN VIRAL HEPATITIS.
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h Anat 348(4):309-327, 1969.

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(*Ger.*) Krassnitzky, O. (1 Med. Clin. U.
nna, Austria), F. Pesendorfer and F. Wewalka.
tsch Med Wschr 95(6):249-253, 1970.

83 EPIDEMIOLOGY OF SERUM HEPATITIS IN VIENNA.
(*Ger.*) Valasek, W. (Kaiser Franz Joseph
sp., Vienna, Austria). *Wein Med Wschr* 120(3):38-
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OF VIRAL HEPATITIS. (*It.*) Pasquale, A.
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Cerutti and L. Soranzo. *Minerva Med*
99):4985-4998, 1969.

85 ANICTERIC AND ICTERIC HEPATITIS AFTER OPEN-
HEART SURGERY. (*E.*) Morrison, G. R.
ashington U. Sch. Med., St. Louis, Mo.), V. J.
oskey, B. P. McQuillan and B. M. Parker.
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86 SCARLATINIFORM ERUPTION IN VIRAL HEPATITIS.
(*E.*) Lynfield, Y. L. (Brooklyn VA Hosp.,
York) and A. E. Prestia. *Arch Derm* 101(3):352-
5, 1970.

Diagproc (2501)
D:Gen (2947)
D:Gen:Parasit (3005)

2887 LYMPHOCYTE TRANSFORMATION IN CHRONIC HEPATITIS AND OTHER HEPATIC DISEASES. (*Ger.*) Scheiffarth, F. (U. Hosp. Erlangen Nuremberg, Germany), H. Warnatz, R. Ottenjann and H. Ritter. *Arch Klin Med* 216(5):447-456, 1969.

2888 COMPARATIVE VALUE OF BIOCHEMICAL TESTS IN PATIENTS WITH CHRONIC HEPATITIS AND CIRRHOSIS OF THE LIVER TREATED WITH GLUCOCORTICOID THERAPY. (*Rus.*) Shulman, V. Sh. (Sanit. Hyg. Med. Inst., Leningrad, USSR), O. M. Tatarinova and G. Z. Barenblat. *Ter Arkh* 41(11):88-93, 1969.

2889 SOME INDICES OF EXTERNAL RESPIRATORY FUNCTION IN CHRONIC HEPATITIS AND LIVER CIRRHOSIS. (*Rus.*) Suleeva, L. K. (Res. Inst. Invalids, Dnepropetrovsk, USSR) and R. A. Tisova. *Sovet Med* (11):143-144, 1969.

2890 ANALYSIS OF THE RHEUMATOID FACTOR BY GEL FILTRATION (SEPHADEX G-200) IN CHRONIC HEPATOPATHIES. (*Cz.*) Tichy, M. (Charles U., Hradec Králové, Czechoslovakia) and Z. Hrncir. *Cesk Gastroent Vyz* 23(7):312-317, 1969.

- D:Livbil:A.Nonv.Hep (2865)
- D:Livbil:A.V.Hep (2869)

391 SERUM MAGNESIUM IN CHILDREN WITH CIRRHOSIS.
(*E.*) Cohen, M. I. (Montefiore Hosp.,
onx, N. Y.), H. McNamara and L. Finberg. *J Pediat*
(3):453-455, 1970.

aldosterone antagonist, spironolactone, was ad-
nistered to 15 children and adolescents (8 weeks
15 years of age) with documented cirrhosis, to
udy its effect on the hypomagnesemia associated
th liver disease. After determining the serum
gnesium value in all subjects, 7 patients were
ven spironolactone (5 mg/kg body weight/day) orally
to a maximum dose of 100 mg/day for a period of
days to 4 weeks. Serum magnesium determinations
re repeated after completion of spironolactone
eatment. The mean serum magnesium values for the
cirrhotic patients before spironolactone therapy
s 1.63 mEq/liter with a range of 1.21 to 1.93, com-
red with a normal value of 2.00 ± 0.15 mEq/liter.
r the seven children treated with spironolactone
e mean value rose significantly to a mean value of
93 mEq/liter, with a range of 1.71 to 2.06. Mag-
sium levels returned to a normal range in 6 of 7
tients treated with the aldosterone antagonist.

392 DISTRIBUTION OF PROTEIN-BOUND ZINC IN
NORMAL AND CIRRHOTIC SERUM. *(E.)* Boyett,
D. (VA Hosp., Omaha, Nebr.) and J. F. Sullivan.
etabolism 19(c):148-157, 1970.

istribution of protein-bound zinc (^{65}Zn) was
udied in the serum of 18 patients with Laennec's
irrhosis and 10 normal control subjects by
lectrophoresis. Zinc was bound to albumin,
ansferrin, and α_2-macroglobulin in all subjects,
d was bound to immunoglobulin-G in all cirrhotics
d 5/10 controls. Albumin-bound zinc correlated
ll with total serum zinc (r=0.97) which was sig-
ificantly decreased in cirrhotics (control value
.5±12.7 ug/100 ml vs 44.1±20 ug/100 ml). The
w serum zinc levels found in cirrhotics appears
be a function of serum albumin concentration.
inc was consistently bound to transferrin and
-macroglobulin and the total amount bound to
ese proteins was of remarkably constant and
uivalent size in cirrhotics and controls. Trans-
rrin concentration was significantly lower in
irrhotics (control value 3.20±0.52 ug/100 ml vs
.56±0.76 ug/100 ml) and the mean concentration
f α_2-macroglobulin was higher (control value
.63±0.88 ug/100 ml vs 3.29±1.09 ug/100 ml).
here was an apparent reciprocal relationship
etween transferrin-bound zinc and α_2-macro-
lobulin-bound zinc and the amount of zinc bound
transferrin and α_2-macroglobulin was constant
ithin total zinc concentrations as low as
2 ug/100 ml. The constancy of zinc bound to
ransferrin and α_2-macroglobulin implies metabolic
ontrol of this fraction. Transferrin and α_2-macro-
lobulin seemingly play an important role in internal
inc exchange.

893 DEVELOPMENT OF PROTEIN-DROPLET-CONTAINING
VACUOLES IN EXPERIMENTAL CIRRHOSIS OF THE
IVER. *(Ger.)* Haraszti, A. (St. Hosp. Eger, Hungary).
eitr Path Anat 140(1):71-88, 1969.

The ultrastructure of protein-droplet-containing vacuoles which develop after the administration of mixed human plasma was studied by light and electron microscopy in liver cells of normal rats and rats with carbon tetrachloride-induced chronic cirrhosis. The protein-droplet-containing vacuoles were diffusely localized in the periphery of the liver lobules in normal rats but were scattered (with no characteristic localization) in the pseudo lobules in cirrhotic rats. The vacuoles which developed in cirrhotic rats were more numerous and occurred later (30 min vs 10 min after human plasma administration) than in normal rats. There was an increase of smooth endoplasmic reticulum (often accompanied by vesicular changes), spheric mitochondrial changes with moderate cristolysis, hemosiderin granules in lysosomes, and an increase in collagen fibrils in Disse's space in cirrhotic rats. These changes in cirrhotic rats may be due to an increase in connective tissue and formation of basal membranes in liver, which hinder fluid circulation from the sinusoids towards the Disse spaces and the hepatocytes.

2894 ZINC METABOLISM IN ALCOHOLIC LIVER DISEASE. *(E.)* Sullivan, J. F. (VA Hosp., Omaha, Nebr.) and R. P. Heaney. *Amer J Clin Nutr* 23(2): 170-177, 1970.

The kinetics of the metabolism of ^{65}Zn (190 μCi, i.v.) in patients with alcoholic cirrhosis were studied utilizing two-compartmental analysis of values for miscible zinc pool, renal zinc clearance, total zinc turnover, endogenous zinc secretion, and internal loss. Serum zinc levels were decreased and 24-hr urinary excretion of zinc was normal but plasma clearance of zinc was increased (0.857 ml plasma/min) from normal values (0.33 ml/min) in 7/10 patients. About 20 to 30 hr were required for plasma and urine zinc to reach isotopic equilibrium in these patients. The mean total ^{65}Zn excretion (over a 10-day period) was 11.29% of the administered dose and the bulk of the percentage was via the intestinal tract. The mean value for the miscible zinc pool was 2.79 mg/kg (the estimated fraction of the total pool accounted for by plasma zinc was only 1.87%) and the mean turnover of this pool was 0.173 mg/kg/day (a value 4 times greater than the total plasma zinc level). The mean value for internal loss was 0.132 mg/kg/day and accounted for about 75% of the total pool turnover. The mean value of endogenous fecal zinc excretion was 0.029 mg/kg/day. All patients had severe hepatic dysfunction but there was little correlation of symptomatology and measurements of zinc metabolism.

2895 BLOOD COAGULATION IN LIVER CIRRHOSIS. *(It.)* Ferri, F. (Dept. Med., U. Pavia, Italy). *Minerva Med* 60(99):4971-4978, 1969.

2896 SURGICAL TREATMENT OF ASCITES DUE TO HEPATIC CIRRHOSIS. (*Ger.*) Meier, A. L. (St. Clara Hosp., Basel, Switzerland). *Deutsch Med Wschr* 95(1):12-14, 1970.

2897 PATHOGENESIS OF ANEMIA IN HEPATIC CIRRHOSIS. (*Rus.*) Zolotnitskaya, R. P. (I. M. Sechenov Med. Inst., Moscow, USSR) and V. L. Uzyanova. *Sovet Med* (11):141-143, 1969.

2898 EFFECT OF DEXAMETHASONE ON THE LIPOPROTEIN LIPASE AND POSTHEPARIN ESTERASE ACTIVITY IN CIRRHOTIC PATIENTS. (*Cz.*) Stork, A. (no affil), E. Fabian and J. Sponarova. *Sborn Lek* 71(11-12): 315-318, 1969.

2899 MODERN CONCEPTS OF THE PHYSIOPATHOLOGY OF THE HYDROELECTROLYTIC METABOLISM AND ACID-BASE EQUILIBRIUM IN HEPATIC CIRRHOSIS. (*It.*) Maschio, G. (Methodol. Clin., U. Padua, Italy). *Recent Progr Med* 47(5):411-419, 1969.

2900 LAENNEC'S CIRRHOSIS WITH DISTURBED 5-HYDROXYTRYPTAMINE METABOLISM. (*E.*) Mustala, O. O. (U. Central Hosp., Helsinki, Finland), M. Kekki and P. Pentikainen. *Ann Clin Res* 1(3):197-198, 1969.

2901 SERUM TRANSAMINASES IN INFANTILE CIRRHOSIS OF THE LIVER. (*E.*) Mehta, J. B. (Bombay Hosp., India) and S. C. Bansal. *Bombay Hosp J* 11(4):153-156, 1969.

2902 PROLONGED EVOLUTION OF ZIEVE'S SYNDROME IN A CIRRHOTIC WOMAN. (*Fr.*) Vesin, P. (Central Hosp. Argentuil, France), C. Wenisch, J. De Saint-Steban and R. Viguie. *Arch Franc Mal Appar Dig* 58(12):773-780, 1969.

2903 THE LINTON-NACHLAS TUBE: ITS SUPERIORITY OVER THE SENGSTAKEN-BLAKEMORE TUBE FOR PLUGGING ESOPHOGASTRIC VARICES IN CIRRHOSIS. (*Fr.*) Bertrand, L. (Hosp. St. Eloi, Montpellier, France) and H. Michel. *Arch Franc Mal Appar Dig* 58(12):797-816, 1969.

2904 METHODS AND SURGICAL INDICATIONS FOR THE TREATMENT OF PORTAL HYPERTENSION IN CIRRHOSIS. (*Fr.*) Surier, E. C. (no affil) and C. Partensky. *J Med Lyon* (1177):1823-1829, 1969.

2905 HYDROLYSATE AND ANTITOXIC FACTORS OF THE LIVER IN THE PREOPERATIVE AND POSTOPERATIVE TREATMENT OF HEPATIC CIRRHOSIS PATIENTS. (*Por.*) La Gamba, F. (Ipiranga Hosp., Brazil), J.M. Neto, C.A. Puglia, J. Thome and S.A. Chaib. *Hospital* 76(4): 1455-1471, 1969.

- Diagproc (2512)
- D:Livbil (2814)
- D:Livbil:C.Hep (2887)(2888)(2889)

)6 DISORDERS OF BILE FLOW: PAPILLOTOMY OR
CHOLEDOCHO-DUODENOSTOMY. *(Ger.)* Lichten-
r, F. (Hamburg-Harburg Hosp., Germany) and H.R.
ptow. *Munchen Med Wschr* 112(4):129-134, 1970.

ty-two choledocho-duodenostomies and 141 trans-
denal papillotomies were performed within the
t 10 years at Harburg Hospital with a mortality
e of 9.6 % and 9.9 %, resp., and a nonlethal
t-surgical complication rate of 7.7 % and 17.8 %,
p. (pancreatitis was the most frequent complication
llowing papillotomy). The high rate of fatalities
choledochoduodenostomy was due to the advanced
e and deterioration of the patients. Papillotomy
uld be limited to indications such as papillary
nes or papillary stenosis.

7 EFFECT OF CHOLECYSTECTOMY ON BILE FLOW
AND COMPOSITION IN RESPONSE TO FOOD.
) Nahrwold, D. L. (Indiana U. Med. Ctr.,
ianapolis) and M. I. Grossman. *Amer J Surg*
(1):30-34, 1970.

effect of cholecystectomy on bile flow and
position in response to food was studied using
istula which permitted collection of bile after
passed through the choledochoduodenal
incter. The feeding responses for bile flow
e, bicarbonate concentration, and bicarbonate
put were unchanged by cholecystectomy. Bile
t concentration and output increased markedly
er feeding when the gallbladder was present,
remained at basal prefeeding levels after
lecystectomy.

8 ALTERATION OF MICROSOMAL BIOTRANSFORMATION
IN THE LIVER IN CHOLESTASIS. *(E.)*
terer, F. (Mt. Sinai Sch. Med., City U. New York,
Y.), P. G. Bacchin, I. H. Raisfeld, J. B.
enkman, F. Schaffner and H. Popper. *Proc Soc Exp
l Med* 133(2):702-706, 1970.

eration of microsomal biotransformation in the
er in induced cholestasis was studied in male
ague-Dawley rats with ligated bile ducts. Four
s following bile duct ligation, there was a marked
rease in aminopyrine demethylase activity, while
tent of cytochrome P-450, aniline hydroxylase,
PH-cytochrome c-reductase, and cytochrome P-450
uctase were slightly decreased in liver micro-
es. Bile duct ligation did not impair binding
type II substrate (aniline) but the binding of
e I substrate (hexobarbital) was severely re-
icted and its stimulating effect on P-450 re-
tase was abolished. In cholestasis, the hypo-
ivity of the biotransformation system in the
oth endoplasmic reticulum seemingly is the result
an impaired type I binding which may contribute
cholestasis perpetuation by impairing ring hydrox-
tion necessary for cholate synthesis, the prime
er of bile.

2909 INDICATION FOR CHOLECYSTECTOMY IN CHOLELITHIASIS. *(Ger.)* Kurz, W. (Dist. Hosp., Lubben, Germany) and G. Teuscher. *Z Aerztl Fortbild* 63(24):1289-1293, 1969.

2910 GLUCOCORTICOID AND ANDROGEN SECRETION IN PATIENTS WITH CHOLECYSTITIS AND OBSTRUCTIVE JAUNDICE PRIOR TO AND AFTER SURGERY. *(Rus.)* Skripnichenko, D. F. (Med. Sch. Kiev, USSR) and V. I. Mamchich. *Vestn Khir Grekov* 103(11):34-36, 1969.

2911 PHARMACOLOGICAL AND CLINICAL ASPECTS OF A NEW CHOLERETIC, 1-MORPHOLINOACETYL-3-PHENYL-4-OXO-1,2,3,4-TETRAHYDROQUINAZOLINE HYDROCHLORIDE. *(It.)* Grossi, F. (Inst. Sys. Therap. Med., Hydro. Med., U. Rome, Italy) and S. Spada. *Clin Ter* 50(3):203-232, 1969.

2912 BLOOD SERUM CERULOPLASMIN ACTIVITY AND CONTENT OF COPPER IN THE BLOOD, ORGANS AND TISSUES IN ACUTE CHOLECYSTITIS. *(Rus.)* Kikot, V. A. (A. A. Bogomolets Med. Inst., Kiev, USSR). *Klin Khir* (11):58-60, 1969.

2913 MICROELEMENT CONTENT IN DOG BLOOD, ORGANS AND TISSUES IN EXPERIMENTAL CHOLECYSTITIS. *(Uk.)* Kovalev, M. M. (A. A. Bogomolets Med. Inst., Kiev, USSR) and B. A. Kikot. *Fiziol Zh* 15(6):766-770, 1969.

2914 DUODENOBILIARY RELATIONS IN PATHOLOGY OF THE BILE DUCTS AND PANCREAS. *(Rus.)* Milonov, O. B. (Clin. Exp. Med. Res. Inst., Min. Publ. Hlth., USSR, Moscow), V. I. Sokolov, R. L. Dubrovsky, Yu.F. Pautkin, A. A. Movchun, R. A. Sukhomina and N. T. Ermakov. *Khirurgiia* 45(11):56-63, 1969.

2915 INVESTIGATION OF PROTEINS IN THE BILE OF PATIENTS WITH CHOLECYSTITIS. *(Rus.)* Sokolova, N. V. (Pediat. Med. Inst., Leningrad, USSR). *Ter Arkh* 41(11):73-74, 1969.

2916 PERFORATION OF THE GALLBLADDER INTO THE PERITONEAL CAVITY IN SUBJECTS MORE THAN SEVENTY YEARS OLD. *(It.)* Broglia, S. (Central Hosp., Rome, Italy), P. Malatesta and G. Misiti. *Gazz Int Med Chir* 74(19):1689-1695, 1969.

2917 INFLUENCE OF GALLBLADDER AND BILIARY TRACT DISEASES ON LIVER MORPHOLOGY. *(Pol.)* Rusin, Z. (Military Med. Acad., Warsaw, Poland). *Pol Przegl Chir* 41(11):1492-1498, 1969.

2918 THE MOTOR FUNCTION OF THE GALLBLADDER IN CHRONIC CHOLECYSTITIS. *(Rus.)* Lindenbraten, L. D. (I. M. Sechenov Med. Inst., Moscow, USSR). *Klin Med (Moskva)* 47(10):57-61, 1969.

2919 THE CLINICAL FEATURES OF CANDIDIASIS OF THE BILIARY TRACT. *(Rus.)* Kaplan, F. S. (Central Inst. for the Development of Physicians, Moscow, USSR). *Klin Med* 47(10):137-139, 1969.

2920 CYSTS OF THE COMMON BILE DUCT. *(Rus.)* Duberman, L. B. (Munic. Hosp., Sokolsk, USSR) and V. S. Kovshikov. *Khirurgiia* 45(11):63-68, 1969.

2921 PRIMARY SCLEROSING CHOLANGITIS. (*It.*) Valentini, S. B. (Central Hosp., Rome, Italy). *Chir Gastroent* 3(3):375-380, 1969.

2922 SPONTANEOUS EXTERNAL BILIARY FISTULAS. (*E.*) O'Reilly, K. (Mater Misericordia Hosp., Brisbane, Australia). *Med J Aust* 57(2):63-64, 1970.

2923 CHOLEDOCHODUODENOSTOMY: AN UNJUSTLY MALIGNED SURGICAL PROCEDURE? (*E.*) Madden, J. L. (St. Clare's Hosp., New York, N. Y.), J. Y. Chun, S. Kandalaft and M. Prekh. *Amer J Surg* 119(1):45-54, 1970.

2924 PARTIAL COMMON DUCT OBSTRUCTION PRESENTING AS FEVER OF UNKNOWN ORIGIN. (*E.*) Caravati, C. M. (Med. Coll. Virginia, Richmond) and C. L. Cooke. *Virginia Med Month* 97(2):99-103, 1970.

2925 WHEN TO OPERATE FOR ACUTE CHOLECYSTITIS. (*E.*) Hilton, H. D. (Bryan Mem. Hosp., Lincoln, Neb.) and W. T. Griffin. *Postgrad Med* 47(2):120-124, 1970.

2926 TREATMENT OF ACUTE CHOLECYSTITIS. (*E.*) Galvin, C. (St. Catharine's Hosp., Tralee, Ireland) and M.A.K. Zakaria. *J Irish Med Ass* 63(391):18-21, 1970.

2927 CHOLANGITIS, A REVIEW OF THE LITERATURE WITH A REPORT OF AN ILLUSTRATIVE CASE. (*E.*) Roth, P. (Southern California Permanente Med. Group., Panorama City) and S. Cohen. *Amer J Gastroent* 53(2):154-163, 1970.

2928 JAUNDICE IN NEONATES: WITH SPECIAL EMPHASIS ON BILIARY ATRESIA. (*E.*) Movassaghi, N. (George Washington U. Sch. Med., Washington, D. C.), G. B. Avery, L. Singer, J. Randolph and J. Pleasure. *Clin Proc Child Hosp DC* 26(2):51-69, 1970.

2929 PLANNING THE OPERATION FOR CHOLECYSTOENTERIC FISTULA WITH GALLSTONE ILEUS. (*E.*) Fox, P. F. (Loyola U. Stritch Sch. Med., Maywood, Ill.). *Surg Clin N Amer* 50(1):93-102, 1970.

2930 CONGENITAL EXTRAHEPATIC BILIARY ATRESIA IN TWO BROTHERS. (*E.*) Nevin, N. C. (Belfast City Hosp., Ireland), M. Bell, M.J.L. Frazer and P. Froggatt. *J Med Genetics* 6(4):379-381, 1969.

2931 SURGICAL CONDITIONS COMPLICATING PREGNANCY: II. DISEASES OF THE GALLBLADDER AND PANCREAS. (*E.*) O'Neill, J. P. (Roy. Women's Hosp., Melbourne, Australia). *Aust New Zeal J Obstet Gynaec* 9(4):249-252, 1969.

2932 BILE ASCITES. (*E.*) Rosato, E. F. (U. Pennsylvania Sch. Med., Philadelphia), H. D. Berkowitz and B. Roberts. *Surg Gynec Obstet* 130(3):494-496, 1970.

2933 PRIMARY CARCINOMA OF THE GALLBLADDER. (*E.*) Kelly, T. R. (Akron City Hosp., Ohio) and I. A. Gradisar. *Arch Surg* 100(3):232-235, 1970.

2934 SELECTION OF AN OPTIMAL PROCEDURE FOR DECOMPRESSION OF THE OBSTRUCTED BILE DUCT. (*E.*) Morgenstern, L. (Cedars-Sinai Med. Ctr., Los Angeles, Calif.) and J. M. Shore. *Amer J Surg* 119(1):38-44, 1970.

2935 STENOSIS OF THE SPHINCTER OF ODDI. (*E.*) Shingleton, W. W. (Duke U. Med. Ctr., Durham, North Carolina) and D. Gamsburg. *Amer J S* 119(1):35-37, 1970.

2936 PRIMARY CHOLANGITIS. (*Fr.*) Heully, F. (Nancy, France), M. Bessot, P. Gaucher, F. Vicari, J. Laurent and J. Dossman. *Arch Franc Mal Appar Dig* 58(12):757-772, 1969.

2937 EXTRA-HEPATIC OBSTRUCTIVE ICTERUS. (*Por* DeMello, J. B. (Fac. Med. U. San Paulo, Brazil). *Hospital* 76(5):1581-1592, 1969.

2938 SINGLE AND MULTIPLE OPERATIONS ON THE BI IARY TRACT. (*It.*) Rinaldi, M. (Dept. Su U. Padua, Italy), A. Bano and A. Vianello. *Chir Ital* 20(5):877-931, 1968.

2939 EARLY, APPARENTLY PRIMARY, POST-OPERATI ICTERUS. (*Fr.*) Levrat, M. (Hosp. Eduoa Herriot, Lyon, France) and E. Phelip. *Arch Franc Mal Appar Dig* 58(12):781-796, 1969.

2940 CLINICAL AND ULTRASTRUCTURAL STUDY IN A CASE OF ROTOR-SYNDROME. (*Fr.*) Okolicsa L. (Inst. Anat. Path., U. Lausanne, France), A. Torrado, D. Nussle, D. Gardiol and A. Gautier. *F Int Hepat* 19(6):393-406, 1969.

2941 TECHNIQUE AND RESULTS OF 1316 BILIARY DUCT OPERATIONS. (*Ger.*) Michelsen, E. (Dist. Hosp. Rostock, Germany) and G. Braumer. *Bruns Beitr Klin Chir* 217(7):604-612, 1969.

- P:Morph (2277)
- Diagproc (2502)(2505)(2507)(2512)(2521)(2530)(2537)
- D:S.Intest (2735)(2749)
- D:Pancreas:Pancreat (2786)
- D:Livbil (2846)
- D:Gen (2943)
- D:Gen:Parasit (3003)

:2 DIABETIC DIARRHEA AND STEATORRHEA: MICROBIOLOGICAL AND CLINICAL OBSERVATIONS. *(E.)*
.dstein, F. (Jefferson Med. Coll. Hosp., Philadel-
.a, Pa.), C.W. Wirts and O.D. Kowlessar. *Ann*
:ern Med 72(2):215-218, 1970.

robic bacterial cultures of upper gastrointestinal
irates were performed in 10 patients with diabetes
litus and gastrointestinal disturbances (nine
ients had diarrhea, and 5 also had steatorrhea).
ty-nine control subjects showed normal bacterial
wth ranging from 0 to 5 X 10^5 colony-forming units
u) per ml, with a mean of 3 X 10^4 cfu per ml.
mal bacterial growth was found in 7 patients.
patient with excessive bacterial growth (6.4 X
cfu per ml) had gastric atony without diarrhea
le two patients with diabetic diarrhea and
atorrhea had excessive small intestinal bacterial
nts (10^6 to 10^7 cfu per ml). In the latter two
ients, diarrhea and steatorrhea were controlled
antibiotics indicating that they represented
ther variant of the blind-loop syndrome respon-
e to antibiotic treatment.

3 AMYLASE AND LIPASE SECRETION IN THE HEPATIC AND INTESTINAL LYMPH: III. STUDIES
OLVING OBSTRUCTION OF THE SMALL INTESTINE OR BILE
T IN DOGS. *(E.)* Howard, J. M. (Hahnemann Med.
l., Philadelphia, Pa.), H. Singh, H. E. Appert
F. W. Pairent. *Arch Surg* 100(3):253-256, 1970.

estinal obstruction and common bile duct obstruc-
n were experimentally produced in 8 dogs to in-
tigate the concentration changes of amylase and
ase in the serum and in the lymph draining the
tructed area. An observation period of four to
days revealed no marked increase in lymph or
um enzyme levels in simple jejunal obstruction.
obstructed jejunum apparently does not increase
lase concentration. The amylase concentration in
e (0 to 30 min after secretin i.v. injection) was
± 3.4 units per ml, which was nearly 25% of the
centration in serum (37.0 ± 6.7), whereas lipase
els in bile (1.3 ± 0.9) were comparable to those
serum (1.9 ± 0.5). Occlusion of the common he-
ic bile duct for periods of up to seven days re-
led no significant increase in amylase concentra-
n in serum or in hepatic lymph (lipase concentra-
n was increased slightly above normal).

UPPER ALIMENTARY TRACT CANCER IN NATAL INDIANS WITH SPECIAL REFERENCE TO THE
L CHEWING HABIT. (*E.*) Schonland, M. (Durban Med.
, U. Natal, India) and E. Bradshaw. *Brit J*
er 23(4):670-682, 1969.

r alimentary tract cancer and its relation to
l-chewing habit was studied in South African
ans in the Durban region. Cancers of the mouth,
at, esophagus, and stomach are more common in
an females than males (56.1 females per 100,000
lation versus 34.5 males per 100,000 population);
ined incidence of neoplasms is high (90.6 Indians
100,000 population versus 51.7 English per
000 population). General incidence of betel-
ing in the Indian population showed that more
les (1842, of all ages, 30.7%) chewed betel than
s (1836, of all ages, 5.5%). Percentage of chewers increased with age in both sexes thus, 10.3% of males and 71.9% of females, in age group 60 yr or more, chewed betel. There is a tendency towards greater westernization in Indian males and this may account for less betel-chewing in males (habit appears to be decreasing in both sexes and the duration of the habit and age of adoption of habit did not differ between sexes). Social or health reasons were given as reasons for adoption of the habit. Unpleasant effects were diaphoretic and pleasant effects were tranquilizing. A possible association between betel-chewing and upper alimentary tract cancer seemingly exists, with elements other than tobacco being suspect.

2945 RESPONSE OF THE RABBIT ILEAL LOOP TO CELL-FREE PRODUCTS FROM *EXCHERICHIA COLI* ENTEROPATHOGENIC FOR SWINE. (*E.*) Moon, H. W. (Agric. Res. Serv., U.S. Dept. Agric., Ames, Iowa), S. C. Whipp, G. W. Engstrom and A. L. Baetz. *J Infect Dis* 121(2): 182-187, 1970.

Enterotoxin contained in broth culture supernates from strains of *E. coli* enteropathogenic for swine was quantified in ligated loops of rabbit ileum and pig jejunum. Rabbit ileum was more sensitive to *E. coli* enterotoxin than pig jejunum although the living bacteria did not consistently cause positive reactions in rabbit ileal loops. Agitation during growth was used to increase the concentration of enterotoxin produced and enterotoxin activity was heat labile, nondialyzable, and withstood lyophilization and storage at 4°C. The gross appearance of the reactions of the ligated intestinal loops and the fluids produced in response to *E. coli* enterotoxin were similar in rabbits and pigs.

2946 CHANGES IN MESENTERIC MICROCIRCULATION IN MALABSORPTION DURING GASTROINTESTINAL PARALYSIS. *(E.)* Poka, L. (U. Med. Sch., Pecs, Hungary), E. Foldi, G. Czirbusz, A. Farkas and I. Bartek. *Acta Chir Acad Sci Hung* 10(3):311-319, 1969.

Blood flow in the small intestine of 23 adult dogs was studied by means of $Na_2H^{32}PO_4$ and $^{86}RbCl$ extraction and histochemical analyses. Total body cardiac output and total capillary resistance showed no statistically significant changes as a result of anesthesia or surgery but the operation reduced small intestinal blood flow by about 50% with a corresponding rise in peripheral resistance. Anesthesia significantly reduced renal blood flow and peripheral resistance, and the operation caused no further change in this respect. Changes in cardiac and hepatic microcirculation were not significantly different. Histochemical analysis revealed edema, stasis, capillary dilatation and venous collapse in the intestinal wall. Constriction of the mesenteric vessels and the consequent stagnant hypoxia apparently is responsible for the diminished alkaline phosphatase and ATPase activity of the mucosal cells observed in human intestinal paralysis after abdominal surgery and in the defective absorption following gastric operations in the dog.

2947 CELLULAR LOCALISATION OF AUSTRALIA ANTIGEN IN THE LIVER OF PATIENTS WITH LYMPHOPROLIFERATIVE DISORDERS.

(E.) Nowosławski, A. (St. Inst. Hyg., Warsaw, Poland), W. J. Brzosko, K. Madalinski and K. Krawczynski. *Lancet* 1(7645):494-497, 1970.

Australia (Au) antigen was detected by means of immunofluorescence in the liver taken at necropsy of six patients with lymphoproliferative disorders who were seropositive for this antigen, but had no clinical or laboratory evidence of liver disease. Specific fluorescence was confined to the nuclei and cytoplasm of hepatic parenchymal cells, and aggregations of virus-like particles (20 μ diameter) were observed in the hepatocyte nuclei and were identical with particles precipitated out of the area of all Au-positive patients by anti-Au antibody. Au antigen or virus-like particles were not detected in the liver of six patients with lymphoproliferative disorders who were seronegative for Au antigen. In two of the Au-positive patients histological changes were characteristic of a mild form of chronic hepatitis. In some patients with lymphoproliferative disorders a state of specific tolerance may develop together with an apparently benign proliferation of Au antigen in hepatocytes.

2948 REVERSIBLE JEJUNAL DISACCHARIDASE DEFICIENCY IN CHOLERA AND OTHER ACUTE DIARRHEAL DISEASES.

(E.) Hirschhorn, N. (Beth Israel Hosp., Boston, Mass.) and A. Molla. *Johns Hopkins Med J* 125(6):291-300, 1969.

In a study of fourteen Pakistani adults with acute cholera and non-cholera enteritis the jejunal disaccharide activity was measured and lactose and xylose tolerance tests were performed. Jejunal sucrase, maltose, palatinase and lactose were depressed in all 14 patients but all disaccharide activities increased at some time during convalescence. Serial biopsy studies suggest that the diarrhea and subsequent recovery of fluid and electrolyte balance were responsible for the changes in enzyme activity. Absorption of d-xylose improved significantly only on the group with cholera, but hydrolysis of lactose and lactose activities remained abnormally low during convalescence in 13 out of 14 patients.

2949 CLINICAL NONSPECIFICITY OF MILK COPROANTIBODIES IN DIARRHEAL STOOLS.

(E.) Davis, S. D. (U. Wash. Sch. Med., Seattle), C. W. Bierman, W. E. Pierson, C. W. Maas and A. Iannetta. *New Eng J Med* 282(11):612-613, 1970.

Stool specimens from 3 groups of infants (2 to 24 months of age) were tested to verify reports indicating that infants with a gastrointestinal sensitivity to cow's milk will have precipitins to cow's milk proteins in the stool. Stools from two patients with gastrointestinal sensitivity, from 36 of 38 infants with acute diarrhea, and from 7 of 11 healthy breast-fed infants contained precipitin to cow's milk proteins (whey). The major antigen was in the alpha-lactalbumin-rich fraction of the cow's milk, and precipitin lines of identity formed when adjacent wells in agar contained whey and alpha-lactalbumin fraction. These studies do not exclude antibodies of the intestinal tract as significant factors in the pathogenesis of gastrointestinal milk sensitivity.

2950 INTESTINAL FLORA OF FOLATE-DEFICIENT MICE.

(E.) Klipstein, F. A. (U. Rochester Sch. Med. Dent., N. Y.) and S. D. Lipton. *Amer J Clin Nutr* 23(2):132-140, 1970.

The aerobic bacterial content of the proximal intestine and colon was compared in 20 weanling mice fed a folate-free diet and in mice fed a diet containing folic acid. Liver concentrations of folate were reduced (normal value was 9 μg/g liver) one week following weaning and values became progressively more subnormal with continuation of folate-deficient diet. Mice on the folate-free diet showed reduced weight gain within one week after weaning and developed diarrhea after three weeks. Incidence and concentration of gram-positive organisms (Lactobacillu Enterococcus, Streptococcus, or E. coli) was simila in both groups of mice but there was an increased occurrence of A. aerogenes and Proteus species in the intestinal tract of folate-deficient mice (with these coliform-type organisms isolated more commonly from both intestinal segments in both species and from the jejunum in 95% of the folate-deficient group and 55% of the normal group). All coliform organisms, one-half of the enterococci, and one-fourth of the Lactobacillus species isolated were capable of folate synthesis. The presence of folat synthesizing bacteria in the proximal intestinal tract did not prevent folate deficiency in the grou of mice fed a folate-free diet. Folate synthesized by bacteria seemingly is unable to meet metabolic requirements of mice under these circumstances.

2951 EXPERIMENTAL STUDIES ON ARTERIAL AND VENOUS MESENTERIC OCCLUSION: II. SYSTEMI EFFECTS WITH SPECIAL REFERENCE TO THE ROLE OF LYMP FLOW.

(E.) Ahonen, J. (Dept. Surg., U. Turku, Finland), T. Havia, M. V. Inberg, A. J. Jaaskelain and T. M. Scheinin. *Ann Med Exp Biol Fenn* 47(4):2 271, 1969.

Acid phophatase, lactic acid, pO_2, and acid-base balance were studied in 4 dogs with occlusion of t superior mesenteric artery, in 2 dogs with occlusi of the superior mesenteric vein, and in one dog wi occlusion of the superior mesenteric vein and the thoracic duct. A 3 to 5 hr occlusion of the super mesenteric artery produced rapid tissue damage wit few systemic effects. Lactic acid increased by 50 and acid phosphatase activity doubled in the lymph during arterial occlusion (red blood cells were al found in the lymph). Mesenteric vein occlusion resulted in massive sequestration of fluid in the affected area which was effectively drained due to increased lymph flow. In arterial occlusion, arte ial hypotension had a harmful effect on the intesinal wall which was aleviated by increased oxygenation. In all cases studied, the pO_2 in the lymph as high and occlusion of both the mesenteric vein nd the thoracic duct resulted in rapid damage to he mucosa with pronounced systemic effects and increased lymphatic concentration of lactic acid with n accompanying fall in pH and pO_2 in both arterial nd venous blood.

952 ANTIBODIES AGAINST DELOMORPHOUS CELLS AND INTRINSIC FACTOR IN GASTROINTESTINAL ISEASES AND DIABETES MELLITUS. *(Ger.)* Fixa, B. 1st Med. Clin., U. Hamburg, Germany), K. Krentz nd G.B. Roemer. *Med Klin* 65(1):17-21, 1970.

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955 ANABOLIC STEROIDS IN THE TREATMENT OF GASTROINTESTINAL TRACT DISEASES. (*Rus.*) evchikh, V. V. (Med. Inst., Izhevsk, USSR). *Ter rkh* 41(11):69-72, 1969.

956 STRUCTURE OF THE HEPATIC VEINS IN HUMAN FETUSES AND THE NEWBORN. (*Rus.*) Vsevolodov, . F. (Leningrad Med. Inst. Pediat., USSR), V. N. erbitskaya and E. N. Dolgopolova. *Arkh Anat* 57(12): 6-82, 1969.

957 UROPEPSIN EXCRETION IN PATIENTS WITH ACUTE DYSENTERY. (*Rus.*) Zabolotny, L. S. (Munic. ed. Clin. Med. Inst., Smolensk, USSR). *Ter Arkh* 1(11):106-108, 1969.

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959 IATROGENESIS IN SURGERY ON THE GASTROINTESTINAL TRACT. (*Sp.*) Alamilla, G. (no ffil) and A. Dominguez. *Cir Cir* 37(5):421-432, 969.

960 ENTEROPATHIES AND INTESTINAL MICROBIAL FLORA. (*It.*) Reinlein, J.M.A. (Jimenez iaz Found., Madrid, Spain) and C. M. Fiol. *Minerva ed* 60(94):4678-4686, 1969.

961 AN UNUSUAL LOCALIZATION OF UPPER MESENTERIAL VESSELS. (*Rus.*) Khomeriky, A. A. I. P. Pavlov Med. Inst., Leningrad, USSR). *Vestn hir Grekov* 103(11):140, 1969.

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2971 STUDIES OF BACTERIAL DISEASE IN WEST MALAYSIAN ORANG ASLI: DISTRIBUTION OF PATHOGENS. (*E.*) Haug, N. L. (Capt., Med. Corps, U. S. Army), C. E. Davis, J. Anandan and T. W. Lim. *Med J Malaya* 24(1):24-31, 1969.

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2999 DIARRHEAL DISEASE OF INFANCY IN KABUL. *(E.)* Samadi, A. (Fac. Med. U. Kabul., Afghanistan). *Indian Pediat* 6(8):568-570, 1969.

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- P:Gen (2486)
- Diagproc (2498)(2504)(2514)(2532)
- D:Esoph (2556)
- D:Stomduo (2601)(2615)
- D:S.Intest:Malabs (2688)
- D:Livbil (2841)

3001 HYPERINFECTION SYNDROME WITH *STRONGYLOIDES STERCORALIS*. *(E.)* Rivera, E. (U. Puerto Rico Sch. Med., San Juan), N. Maldonado, E. Velez-Garcia, A. Grillo and G. Malaret. *Ann Intern Med* 72(2):199-204, 1970.

Infection with the parasite nematode, *Strongyloides stercoralis*, can lead to death in patients with various disorders and alteration of the host-parasite relation may result in hyperinfection, characterized by malabsorption, diarrhea, electrolyte imbalance, bacterial or fungal sepsis, coma and death. *Strongyloides stercoralis* hyperinfection was studied in 9 patients hospitalized with leukemia, systemic lupus erythematosus, or leprosy. Eight patients died, even though 4 were treated with thiabendazole. Since diagnosis of hyperinfection is often made only at autopsy, its presence should be suspected in hematologic patients and in patients with diseases of altered immunity.

3002 FERROKINETIC STUDIES ON NORMAL AND FLUKE-INFECTED RABBITS. *(E.)* Dargie, J. D. (Dept. Vet. Physiol. U. Glasgow, Scotland) and W. Mulligan. *J Comp Path* 80(1):37-45, 1970.

The disappearance of radioactive iron from plasma and its subsequent incorporation into red blood cells was studied in normal and in fluke-infested rabbits harboring adult populations of the parasite, metacercariae). There was an initial sharp rise in erythropoiesis in the infected group of animals reflected by a mean utilization of 88% of the injected labeled ^{59}Fe for red cell production, as compared with only 48% in the controls. The shortened half life of 157 hr in red blood cells labeled with ^{59}Fe, compared with a half life of 1572 hr of normal red blood cells, is associated with an increased fecal excretion of the isotope and of hemoglobin iron. The ability of both normal and infected rabbits to re-utilize iron passed into the gut was confirmed by following the fecal excretion of an oral dose of lysed red blood cells labeled with radioactive ^{51}Cr and ^{59}Fe. It was estimated that erythropoiesis in a fluke-infested rabbit proceeds at a rate four times that in a normal animal.

3003 X-RAY DIAGNOSIS OF THE GALLBLADDER MOTOR FUNCTION IN PATIENTS WITH OPISTHORCHOSIS. *(Rus.)* Muzafarov, A. I. (Kazakh Inst. Region. Path., Ust-Kamenogorsk, USSR). *Sovet Med* (11):95-97, 1969.

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3018 HEPATIC AMEBIASIS: CURRENT VIEWPOINTS IN DIAGNOSIS AND THERAPY. *(E.)* Siderides, L. E. (Stamford Hosp., Conn.) and G. O. Strauch. *Connecticut Med* 34(2):96-102, 1970.

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- Diagproc (2537)

DESCRIPTION OF INDEXES

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Cancer, Polyps, Radiological Detection (0188)*

RECTUM

Cancer, Polyps, Precancerous (0188)*

CANCER

Large Intestine, Detection, Radiology (0188)*

DIAGNOSIS

Radiology, Cancer, Large Intestine (0188)*

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  - CHRONIC, DRUG EFFECT, ANTIBODY, SERUM PROTEIN FRACTION (2819)
  - CHRONIC, ENZYME, TRYPSIN (2966)
  - CHRONIC, IMMUNOSUPPRESSIVE DRUG, ANTIVIRAL (2828)
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  - CHRONIC, RESPIRATION, WORK CAPACITY, BLOOD (2889)
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  - CHRONIC, VITAMIN, LIPOIC ACID (2829)
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  - EPIDEMIC, FLY, DYSENTERY (3005)
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  - VIRAL, ACUTE, COMPARATIVE, SUBHUMAN PRIMATE, MAN (2881)
  - VIRAL, ACUTE, SEASONAL VARIATION (2876)
  - VIRAL, ACUTE, SERUM, LEUCOCYTE, MITOSIS, SUPPRESSION, DONOR (2870)*
  - VIRAL, ACUTE, TRANSFUSION, EPIDEMIOLOGY, SERUM PROTEIN FRACTION (2877)
  - VIRAL, ACUTE, CHOLESTASIS, FUNCTIONAL CLEARANCE, DIAGNOSIS, DYE TEST (2878)
  - VIRAL, ACUTE, INFECTIOUS, CHRONIC HEPATIC DISORDER (2880)
  - VIRAL, ACUTE, INFECTIOUS, HEPARIN, BLOOD, LIVER (2874)
  - VIRAL, ACUTE, HOMOLOGOUS SERUM, EPIDEMIOLOGY, INOCULATION, TRANSFUSION (2872)
  - VIRAL, ACUTE, ICTERUS, SURGERY, OPEN-HEART (2885)
  - VIRAL, ACUTE, EPIDEMIOLOGY, VIENNA (2883)
  - VIRAL, ACUTE, EPIDEMIC, BACTERIA, BILIARY TRACT, ANTIBIOTIC (2873)
  - VIRAL, ACUTE, ANTIGEN, LEPROSY (2879)
  - VIRAL, APLASTIC ANEMIA (2867)
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  - VIRAL, CIRRHOSIS, AFTERTREATMENT (2871)
  - VIRAL, COMPARATIVE, SUBHUMAN PRIMATE-MAN (2881)
  - VIRAL, SEASONAL VARIATION (2876)

- VIRAL, SERUM, LEUCOCYTE, MITOSIS, SUPPRESSION, DONOR (2870)*
- VIRAL, TRANSFUSION, EPIDEMIOLOGY, SERUM PROTEIN FRACTION (2877)
- VIRAL, ULTRASTRUCTURE (2296)
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- HIATAL, ESOPHAGUS, DYSRHYTHMIA (2563)
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- PANCREAS, TUMOR (2772)
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- FIBROMA (2666)
- ILEOSTOMY, LONG-TERM REHABILITATION (2679)
- LYMPHOID HYPERPLASIA, POLYPOSIS COLI, FAMILIAL (2669)
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- GALLSTONE, OBSTRUCTION, SMALL INTESTINE (2667)
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- OMENTUM MAJUS, DIAGNOSIS, TUMOR, SURGERY (2747)
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- RHEUMATOID FACTOR, CHRONIC HEPATITIS, HEPATIC CIRRHOSIS (2890)

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- EHRLICH'S CARCINOMA, ASCITES, SPLEEN, MOUSE (2821)
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- ABSORPTION, INTRINSIC FACTOR, VITAMIN B12 (2838)*
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- DRUG ABSORPTION, METABOLISM, IN VIVO METHOD, IN VITRO METHOD (2473)*
- DRUG TRANSPORT, CATION, RAT (2328)
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- COLON, DIVERTICULITIS, SURGERY (2755)
- COLON, FIBROMA, COMPLICATION, INTESTINE (2698)
- COLON, GRANULOMATOUS COLITIS, FOCAL (2759)
- COLON, INTERPOSITION, SUBSTERNAL, ESOPHAGUS, COMPLICATIONS (2704)
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- COLONIC MUCOSA, BICARBONATE AND NON-NA COMPONENTS (2341)*
- CROHN'S DISEASE, ULCERATIVE COLITIS, COMPARISON (2763)*
- DIABETIC DIARRHEA, STEATORRHEA, BACTERIAL GROWTH, ANTIBIOTICS, BLIND LOOP SYNDROME (2942)*
- DYSBACTERIOSIS, TOXIC DILATATION, COLITIS, ULCER, ANTIBIOTIC (2748)
- ESOPHAGOPLASTY, TRANSPLANT, PERISTALSIS (2746)
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- GRANULOMATOUS COLITIS, SURGERY (2758)
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- MUSCLE CONTRACTION, MANOMETRY, INTESTINE SMALL (2538)

- POLYPOSIS, CARCINOMA, RESECTION (2737)
- RECTUM, COLON, INJURIES, DIAGNOSIS, TREATMENT (2711)
- RECTUM, POLYPS, CHILDREN (2723)
- RECTUM, TUBERCULOSIS, RECTO-ILEAL FISTULA, SURGERY (2705)
- SHORT-BOWEL SYNDROME, BOWEL RESECTION, DIETARY FAT, FLUID SECRETION, ELECTROLYTE SECRETION, GASTRIC HYPERSECRETION (2690)*
- TAENIA COLI, CONTRACTION, MEMBRANE POTENTIAL, BETA BLOCKING AGENT, SMOOTH MUSCLE (2474)*
- TRAUMA, SURGICAL PROCEDURE, ABDOMINOPERINEAL PROCEDURE, ILEAL LOOP ANSTOMOSIS (2695)*
- ULCERATIVE COLITIS, FECAL PROTEOLYSIS, ALBUMIN, IGG (2761)*
- ULCERATIVE COLITIS, STEROID THERAPY, SURGERY (2685)*

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- ABSORPTION, BILE SALT, FATTY ACID, MICELLE (2338)*
- ABSORPTION, BILE SALT, JEJUNUM (2404)*
- ABSORPTION, DIGESTION, ADVANCED AGE (2964)
- ABSORPTION, GLUCOSE, HISTIDINE, STARVATION EFFECT (2340)*
- ABSORPTION, GLYCINE (2675)
- ABSORPTION, MUCOSA, SUGAR TRANSPORT, D-ARABINOSE, ILEUM (2325)*
- ABSORPTION, MUCOSA, TOXIC EFFECT (2334)*
- BENIGN TUMOR, INTESTINAL INVAGINATION, SCHWANNOMA, HISTOCYTOFIBROMA (2457)
- BIOPSY, FILTRATION (2676)
- CANCER, INCIDENCE, SYMPTOMATOLOGY (2777)
- CIRCULATION, MESENTERIC ARTERY, OCCLUSION, MUCOSA (2951)*
- CIRCULATION, SURGERY, ANESTHESIA, HYPOXIA (2946)*
- CROHN'S DISEASE, FECAL PROTEOLYSIS, ALBUMIN, IGG (2761)*
- DIVERTICULUM, DUODENUM, JEJUNUM (2665)
- DUODENAL ULCER, CHILDHOOD (2652)
- DUODENUM, BRUNNER'S GLAND, POLYPOID HAMARTOMA, SURGERY (2607)
- DUODENUM, DIVERTICULUM, SURGERY (2673)
- DUODENUM, G-2 POPULATION CELL, CELL DIVISION, MOUSE (2479)
- DUODENUM, OCCLUSION, NEONATE (2617)
- DUODENUM, PEPTIC ULCER, SYMPTOMS (2650)
- DUODENUM, STOMACH, BENIGN TUMOR, DIAGNOSIS, SURGERY (2609)
- DUODENUM, ULCER, CLINICAL TREATMENT (2626)
- DUODENUM, ULCER, PYLOROPLASTY, RADIOLOGICAL ASSESSMENT (2610)
- DUODENUM, ULCER, SURGICAL TREATMENT (2651)
- DUODENUM, ULCERATION, UROLOGICAL SURGERY (2647)
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- ENZYME ACTIVITY, MUCOSA (2285)*
- EROSION, HEMORRHAGE, POST AORTIC RESECTION, ROENTGENOLOGY (2656)*
- EXTROPHY OF THE CLOACA, MANAGEMENT (2714)
- GASTRECTOMY, FUNCTION, MORPHOLOGY, CONTRAST MEDIA (2597)
- HISTOLOGY, ULTRASTRUCTURE, MUCOSA, FREEZING (2290)*
- ILEOSTOMY, LONG-TERM REHABILITATION (2679)
- ILEUM, CHOLINERGIC INHIBITION (2360)
- ILEUM, DIVERTICULITIS, ACUTE (2668)
- ILEUM, FIBROMA (2666)
- ILEUM, TOXOGONIN, PARASYMPATHOLYTIC EFFECT, GUINEA PIG (2476)
- INFARCTION, ISCHEMIA, OCCLUSION (2756)
- JEJUNUM, CIRCULAR AND LONGITUDINAL MUSCLE, ELECTROPHYSIOLOGY, CAT, RABBIT (2358)*
- JEJUNUM, MALABSORPTION, NEOMYCIN-INDUCED, MAN (2685)*
- JEJUNUM, MALABSORPTION, PAROMOMYCIN-INDUCED, MAN (2689)*
- JEJUNUM, MUCOSA, ENZYME, GLYCOLYTIC, GLUCONEOGENIC, ALLOXAN-DIABETES, FASTING (2282)*
- JEJUNUM, MUCOSA, INFANTILE MALABSORPTION, DISACCHARIDASES (2688)*
- JEJUNUM, MUCOSA, PATHOLOGY, METAPLASIA, ULTRASTRUCTURE (2582)*
- JEJUNUM, WATER AND SODIUM ABSORPTION, ABDOMINAL SURGERY (2657)*
- LAMBLIA, VILLI, MOUSE, MUCOSA (3008)
- LIPIDOSIS, NEONATAL, GENETIC, MICE (2426)
- LONGITUDINAL MUSCLE, CONTRACTION, INNERVATION, INHIBITION, HISTAMINE, DRUG EFFECT (2472)*
- MECONIUM ILEUS, SURGICAL TREATMENT (2680)
- MELANOMA, METASTASIS, ULCER, INVAGINATION (2662)
- MICROVILLUS, MEMBRANE, MOLECULAR STRUCTURE (2269)*
- MOTILITY, MANOMETRY, COLON (2538)
- MUCOSA, ABSORPTION, VITAMIN B12 TRANSPORT (2339)*
- MUCOSA, SUBMUCOSA, INFECTION, PATHOLOGY, ELECTRON MICROSCOPY (2658)*
- OBSTRUCTION, ILEUS, GALLSTONE (2667)
- OBSTRUCTION, PARASITE, ILEUS (3016)
- OBSTRUCTION, SEROTONIN, MUCOSA (2659)*
- OCCLUSION, LIPASE CONCENTRATION, AMYLASE CONCENTRATION, BILE DUCT (2943)*
- PATHOLOGY, JEJUNUM, ILEUM, ENTEROTOXIN, E. COLI (2945)*
- PERFORATED DUODENAL ULCER, VAGOTOMY, DRAINAGE (2653)
- PERFORATION, ABDOMEN, BUERGER'S DISEASE (2631)

- PERORAL BIOPSY, DIAGNOSIS, LESION, ATROPHY (2532)
- RESECTION, MICROELEMENT, BLOOD (2661)
- SECRETION, ENZYME ACTIVITY, MUCOSA (2470)*
- SURGERY, ILEUM, BYPASS, CHOLESTEROL EXCRETION (2344)*
- URETERO-ILEAL ANASTOMOSIS, OBSTRUCTION (2624)

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- ABSORPTION, INTESTINE, VITAMIN B12 (2336)*
- PREVALENCE (2372)*
- STOMACH, EPITHELIAL CELL, STORAGE SITE (2376)

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- PALLIATIVE, MALIGNANT STRICTURE, ESOPHAGUS (2572)

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- INTRAGASTRIC, GASTRIC SURGERY (2624)
- SMALL INTESTINE, BENIGN TUMOR, SCHWANNOMA, HISTOCYTOFIBROMA (2681)
- ULCER, SMALL INTESTINE, MELANOMA, METASTASIS (2662)

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- FOLIC ACID, THERAPY, ANEMIA, PREGNANCY (2813)

IRRADIATION
- LIVER, ACUTE, CHRONIC (2836)

ISCHEMIA
- LIVER, PROPHYLACTIC, METHYLPREDNISOLONE, PHENOXYBENZAMINE (2271)*

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- PANCREAS, TUMOR, HORMONE (2772)

ISONIAZID
- HEPATITIS (2861)

JAUNDICE
- ALCOHOLISM, BIOPSY, CIRRHOSIS (2824)
- BILIRUBIN, HYPERBILIRUBINEMIA, NUCLEAR ICTERUS (2846)
- CHILDREN, CAUSES (2928)
- HEPATITIS, ISONIAZID (2861)
- HEPATITIS, SURGERY, OPEN-HEART (2885)
- OBSTRUCTIVE, LAPAROSCOPY, DIAGNOSIS (2521)
- OBSTRUCTIVE, SURGERY, ADRENAL, CHOLECYSTITIS (2910)
- OBSTRUCTIVE ICTERUS, EXTRA-HEPATIC (2937)

JEJUNUM
- ABSORPTION, AMINO ACID, COLON (2342)*
- CIRCULAR AND LONGITUDINAL MUSCLE, ELECTROPHYSIOLOGY, CAT, RABBIT (2358)*
- DIVERTICULUM, DUODENUM (2665)
- DIVERTICULUM, SURGERY (2673)
- MUCOSA, DISACCHARIDASE, INFANTILE MALNUTRITION (2688)*
- MUCOSA, ENZYME, GLYCOLYTIC, GLUCONEOGENIC, ALLOXAN-DIABETES, FASTING (2282)*
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KIDNEY
- ACUTE PANCREATITIS, THROMBOSIS, ENZYMATIC TOXEMIA (2789)
- COPPER, CERULOPLASMIN, ACUTE CHOLECYSTITIS (2972)
- HEPATITIS, CIRRHOSIS, ASCITES, WATER TRANSPORT (2820)
- MUTAROTASE, ENZYME LEVELS, SUGAR REABSORPTION, EMBRYONIC AND NEWBORN RATS (2349)
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- SERUM PROTEIN, MALNUTRITION (2692)

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LACTATE DEHYDROGENASE
- GASTRIC JUICE, DIAGNOSIS, CANCER, PRECANCEROUS STATE (2517)

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- TOLERANCE, GASTRECTOMY, POSTOPERATIVE (2586)*

LEPROSY
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- MITOSIS, SUPPRESSION, SERA, VIRAL HEPATITIS, DONOR (2870)*

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- AMYLASE, CONCENTRATION, OCCLUSION, SMALL INTESTINE, BILE DUCT (2943)*
- PANCREAS, ISOLATION, PURIFICATION (2272)*

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- LIVER, ALCOHOL, BIOCHEMICAL CHANGE, RAT (2835)
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  GASTRIC, ACUTE HYPERSIDERINEMIA, HYDROCHLORIC ACID, GASTRIC SECRETION (2382)
  GASTRIC, ANTIGENISITY (2380)
  GASTRIC, CL FLUXES, CO2 AND HCO3- (2354)
  GASTRIC, CIRCULATION, PROSTAGLANDIN E1, NOREPINEPHRINE (2485)*
  GASTRIC, METABOLISM, CALCIUM, HISTAMINE, ULCER (2640)
  GASTRIC, PROLAPSE, DUODENUM, RADIOLOGY, DIAGNOSIS (2593)
  INTESTINE, ADENOSINE DEAMINASE, CALF (2280)*
  INTESTINE, ULTRASTRUCTURE, HEDGEHOG, HIBERNATION (2501)*
  SMALL INTESTINE (2339)*
  SMALL INTESTINE, ILEUM, HISTOLOGY, ULTRASTRUCTURE, FREEZING (2290)*
  SMALL INTESTINE, ILEUM, TOXIC EFFECT (2334)*
  SMALL INTESTINE, LAMBLIA, VILLI, MOUSE (3008)
  SMALL INTESTINE, STOMACH, METAPLASIA, ELECTRON MICROSCOPY (2582)*
  STOMACH, HISTOLOGY, ULTRASTRUCTURE, HISTAMINE, SEROTONIN (2633)*
  STOMACH, SECRETION, ACID (2628)
  STOMACH, SMALL INTESTINE, SEROTONIN (2659)*
MUSCLE
  CIRCULAR, LONGITUDINAL, JEJUNUM, ELECTROPHYSIOLOGY, CAT, RABBIT (2358)*
  SMOOTH, CONTRACTION, TAPEWORM, POTASSIUM, SODIUM, MEDIUM, ANOXIA (2475)
  STOMACH, ANTRUM, LONGITUDINAL, CIRCULAR, CONTRACTION, MEMBRANE POTENTIAL (2356)*
  WATER AND ELECTROLYTE CONTENT, PYLORIC STENOSIS (2583)*
MYCOSIS
  CANDIDIASIS, BILIARY TRACT, ANTIBIOTIC (2919)
NECROSIS
  LIVER, CARBON TETRACHLORIDE (2419)*
  LIVER, RAT, REGENERATING, N-ACETYL-B-GLUCOSAMINIDASE (2394)*
NEOMYCIN
  MALABSORPTION, INTESTINAL, COLCHICINE, MAGNESIUM SULFATE (2331)*
NEOPLASM
  BLADDER, UTERUS, RADIOLOGY, RECTUM, SIGMOID FLEXURE, TENESMUS, HYPEREMIA, SPASM, PAIN (2736)
NEUTROPENIA
  PANCREAS, IMMUNOGLOBIN (2605)
NICOTINE
  CHOLINERGIC EFFECT, BLOCKING AGENT, MECHANISMS (2350)
NITROGEN
  POSITIVE BALANCE, ABDOMINAL OPERATION (2987)
NOREPHINEPHRINE
  PROSTAGLANDIN E1, CIRCULATION, GASTRIC MUCOSA (2485)*
NORTRIPTYLINE
  PLASMA DISAPPEARANCE, STEROIDS, PERFUSED RAT LIVER, DOG (2457)
NUCLEIC ACID
  RNA, POLYDISPERSE, NUCLEOPLASMIC, SYNTHESIS, ACTINOMYCIN D, LIVER, RAT (2313)
  LIVER, RAT, HEPATECTOMY, REGENERATION (2468)
  PREGNANCY, RAT, LIVER, NUCLEOTIDE, ENZYME (2469)

NUCLEOTIDE
- ENZYME, LIVER, METABOLISM (2284)*
- PYRIDINE, ATP, PHOSPHOLIPID, SYNTHESIS (2416)*

NUTRITION
- PARENTERAL (2998)
- PARENTERAL, DISEASE STATE (2983)
- PARENTERAL, GASTROINTESTINAL DISEASE (2984)
- TRIGLYCERIDE, MILK FORMULA, LOW WEIGHT INFANT (2326)*

OBSTRUCTION
- ACUTE INTESTINAL, SURGERY, CIRCULATION, RESPIRATORY INSUFFICIENCY, PNEUMONIA, SUPPURATION (2963)
- DUODENUM, AORTIC ANEURYSM (2601)
- GASTROINTESTINAL TRACT, ANASTOMOSIS, ULCER, IATROGENESIS, SURGERY (2959)
- INTESTINAL, CONGENITAL, SURGICAL TREATMENT (2680)
- SMALL INTESTINE, ILEUS, GALLSTONE (2667)
- SMALL INTESTINE, PARASITE, ILEUS (3016)
- SMALL INTESTINE, SEROTONIN, MUCOSA (2659)*
- SMALL INTESTINE, SURGERY, ADHESION (2670)
- ULCER, SURGERY, PERFORATION (2645)

OCCLUSION
- DUODENUM, NEONATE (2617)
- INTESTINAL, RETROPERITONEAL CYST, WOLFFIAN BODY, PAIN, LAPAROTOMY (2663)
- VASCULAR, SMALL INTESTINE, ISCHEMIA (2756)

ODDI, SPHINCTER OF
- BILE DUCT, DUODENUM, CHOLANGIOGRAPHY, MOTOR ACTIVITY, PANCREATITIS (2914)
- STENOSIS (2935)

OUABAIN
- WATER, ELECTROLYTE ABSORPTION, INTESTINE, RAT (2348)

OXYGEN
- UTILIZATION, LIVER, EXTERNAL PRESSURE (2459)

PAIN
- ABDOMINAL, SIGMOID DIVERTICULOSIS, AGED SUBJECTS, INFLAMMATION, PERFORATION (2740)

PANCREAS
- ABSORPTION, ADVANCED AGE, DIGESTION (2964)
- ACTINOMYCOSIS, LIVER (2842)
- ACUTE PANCREATITIS, SURGICAL INTERVENTION (2797)
- ANOMALY, SURGERY, DIAGNOSIS, STENOSIS, ULCER (2782)
- CYSTIC FIBROSIS, MECONIUM ILEUS, INFANT, JAPAN (2672)
- DISEASES, UNCOMMON (2771)
- EXOCRINE, HISTOLOGY, HEDGEHOG, HIBERNATION (2320)
- EXOCRINE SECRETIONS, ANTIHYPERTENSION AGENT, RAT (2491)
- CYSTIC FIBROSIS, MUCOVISCOIDOSIS, THROMBOCYTOPENIA, INFANT (2770)*
- DIABETES MELLITUS, HEPATOMEGALY, LIVER (2833)
- DIAGNOSIS, PSEUDOCYST, SURGERY (2775)
- ELASTASE, STRUCTURE, HOMOLOGOUS PROTEINASES (2361)*
- HISTOLOGY, ULTRASTRUCTURE, ISLET CELLS, BETA CELLS, INSULIN ANTIBODY (2780)
- HISTOCHEMISTRY, ENZYME SECRETION (2276)*
- INFLAMMATORY DISEASE, ASCITES, TREATMENT, THORACIC DUCT DECOMPRESSION, LYMPHATIC OBSTRUCTION (2785)*
- INSUFFICIENCY, IMMUNOGLOBIN, NEUTROPENIA (2774)
- JUICE, HUNGER, SECRETION, PANCREOZYMIN (2363)
- LIPASE, ISOLATION, PURIFICATION (2272)*
- PANCREATIC DUCT, OPERATIVE INJURIES (2776)
- PANCREATITIS, ACUTE, PREGNANCY, SURGERY (2931)
- PANCREATITIS, BILIARY TRACT, LYMPHATIC SYSTEM, COMMUNICATION (2786)*
- PANCREATITIS, CHRONIC, DIAGNOSIS, TREATMENT PATHOGENESIS (2796)
- PANCREATITIS, HYPERPARATHYROIDISM (2794)
- PANCREATITIS, MEDICAL TREATMENT, SURGERY (2778)
- PANCREATITIS, TRANSVERSE AXIAL STRATIGRAPHY, ANATAMO-RADIOLOGIC CORRELATIONS (2798)
- PATHOLOGY, CYSTIC FIBROSIS, ULTRASTRUCTURE, FIBROBLASTS (2769)*
- PSEUDOCYSTS, POSTPANCREATITIS, POSTTRAUMATIC, ANASTOMOSIS (2779)
- RIBONUCLEASE, ALKYLATION, BROMOACETATE (2307)
- RIBONUCLEASE, PH, BROMOACETATE (2306)
- RIBONUCLEASE, PRIMARY STRUCTURE, DISULFIDE BOND, PIG (2316)
- RUPTURE, ABDOMEN, SURGERY, ANTIBIOTIC, CLOSED TRAUMA (2783)
- SECONDARY, PANCREATITIS, ACUTE, PARATHYROID ADENOMA (2795)
- SECRETIN, HYDROCHLORIC ACID SECRETION (2385)
- SECRETION, ELASTASE, DRUG EFFECT (2364)
- SECRETION, ENZYME, SURGERY, CHRONIC PANCREATITIS (2788)
- SECRETION, PEPTIDE, STOMACH (2481)*
- TRANSPLANT, DOG, IMMUNOSUPPRESSIVE (2362)
- TUMOR, ISLET CELL, HORMONE (2772)
- ZOLLINGER-ELLISON SYNDROME, DIAGNOSIS (2773)
- ZOLLINGER-ELLISON SYNDROME, GASTRECTOMY (2613)

PANCREATECTOMY
- SURGERY, FRACTURE, HYPOGLYCEMIA, DIET, LIPID, GLUCAGON (2781)

PANCREATIC DISEASE
- ANGIOGRAPHY, DIAGNOSIS, SECRETIN (2768)*

- UNCOMMON (2771)

ANCREATIC DUCT
- OPERATIVE INJURIES (2776)

ANCREATITIS
- ACUTE, BLOOD, PROTEIN, TRYPSIN (2787)
- ACUTE, MYOCARDIAL INFARCTION, ENZYMATIC TOXEMIA (2791)
- ACUTE, PERITONEAL CAVITY, DRAINAGE, HEMORRHAGE, NECROSIS (2790)
- ACUTE, THROMBOSIS, ENZYMATIC TOXEMIA, HEART, LUNG, LIVER, KIDNEY (2789)
- ACUTE, SURGICAL INTERVENTION (2797)
- BILE DUCT, SPHINCTER OF ODDI, DUODENUM, CHOLANGIOGRAPHY, MOTOR ACTIVITY (2914)
- CHRONIC, ACUTE, CANCER, DIAGNOSIS (2522)
- CHRONIC, DIAGNOSIS, TREATMENT, PATHOGENESIS (2795)
- CHRONIC, SURGERY, ENZYME, SURGERY (2788)
- CHRONIC, TRANSVERSE AXIAL STRATIGRAPHY, ANATAMO-RADIOLOGIC CORRELATION (2798)
- HEMORRHAGE, KIDNEY TRANSPLANT, THERAPEUTICS (2793)
- HYPERPARATHYROIDISM (2794)
- MEDICAL TREATMENT, SURGERY (2778)
- RECURRENT, ENZYME, TRYPSIN (2966)
- SECRETION, ENZYME, EDEMA, ACUTE, DIAGNOSIS SCLEROSIS (2792)

ANCREOZYMIN
- PANCREATIC JUICE, HUNGER, SECRETION (2363)

ARASITE
- HYMENOLEPIS MICROSTOMA, AMINO ACID, BILE (3023)
- INTESTINAL, EPIDEMIOLOGY, ALGERIA (3022)
- PERITONEUM, HYDATID (2015)
- PROTOZOA, HELMINTHS, DIAGNOSIS (3017)
- SCHISTOSOMIASIS, BILHARZIOSIS (3021)

ARASITIC DISEASE
- DIARRHEA, MALNUTRITION, INFANT, KABUL (2999)

ARASITOLOGY
- ESOPHAGUS, PHARYNX (3013)
- FECES, INTESTINE (3011)
- GALLBLADDER, MOTOR ACTIVITY, DIAGNOSIS, RADIOLOGY, OPISTHORCHOSIS (3003)
- HYDATID, TAPEWORM, LIVER (3010)
- LAMBLIA, SMALL INTESTINE, MOUSE, MUCOSA, VILLI (3008)
- OBSTRUCTION, SMALL INTESTINE, ILEUS (3016)
- PARASITIC NEMATODE, STRONYLOIDES STERCORALIS, HYPERINFECTION, HEMATOLOGIC DISEASE (3001)
- PLASMA FLUKE, METACERCARIAF, ERYTHROPOESIS, IRON UTILIZATION (3002)*
- ROUNDWORM, LIVER, INTESTINE (3012)
- SURGERY, GASTRIC ULCER, DUODENAL ULCER, OPISTHORCHOSIS, DIAGNOSIS, CHOLECYSTITIS (3009)
- TAPEWORM, EPIDEMIOLOGY, CYSTICERCOSIS (3019)

PARASYMPATHOLYTIC EFFECT
- TOXOGONIN, ILEUM, GUINEA PIG (2476)

PARATHYROID
- ADENOMA, SECONDARY, PANCREATITIS, ACUTE, HYPERCALCEMIA, HYPERURICEMIA, HYPERTENSION (2795)

PARIETAL CELL
- ANTIBODY, GASTRITIS, STOMACH (2602)

PELVIC TRAUMA
- DIAGNOSIS, SCINTIPHOTOGRAPHY (2510)*

PENTENOIC ACID
- GLUCONEOGENESIS, INHIBITION, LIVER, PERFUSED, RAT (2446)

PEPSIN
- ACID, DUODENUM, STOMACH, SECRETIN (2369)*
- ANABOLIC STEROID, PEPTIC ULCER, GASTRIC JUICE, GASTROINTESTINAL TRACT DISEASE (2955)
- DRUG EFFECT, GASTROINTESTINAL TRACT, ABSORPTION (2489)
- GASTRIC JUICE, DOG, GASTRIC FISTULA, 2-DEOXY-D-GLUCOSE (2389)
- UROPEPSIN, SECRETION, ACUTE DYSENTERY (2957)

PEPSINOGEN
- I, II, III, GASTRIC MUCOSA (2390)
- SERUM, GASTRIC SECRETION, HISTAMINE, POLAROGRAPHY (2384)

PEPTIDE
- CHOLECYSTOKININ, CAERULIN, ACID SECRETION (2374)*

PERFORATION
- APPENDIX, SURGERY (2713)
- DUODENAL ULCER, SURGERY, HEMORRHAGE (2636)
- ESOPHAGUS, SURGICAL TREATMENT (2576)
- GALLBLADDER, PERITONITIS, AGED SUBJECTS (2916)
- GANGRENE, DIAGNOSIS, ACUTE APPENDICITIS, SURGERY (2744)
- GASTRIC ULCER, GASTROBRONCHIAL FISTULA, RESECTION DRAINAGE (2596)
- IDEOPATHIC, COLON, NEWBORN (2718)
- RECTUM, BARIUM ENEMA, RADIOLOGY (2702)
- SIGMOID DIVERTICULOSI, AGED SUBJECTS, ABDOMINAL PAIN, INFLAMMATION (2740)
- ULCER, STOMACH, PREGNANCY (2648)
- ULCER, SURGERY, OBSTRUCTION (2645)

PERFUSION
- LIVER, COMA (2837)

PERISTALSIS
- CAT, COLON, MUCOSA, DRUG EFFECT (2477)

PERITONEUM
- APPENDICULAR MUCOCELE, PSEUDOMYXOMA PERITONEI, CYST (2734)
- CYST, PARASITE, HYDATID (2015)
- DRAINAGE, ACUTE PANCREATITIS, HEMORRHAGE, NECROSIS (2790)
- PERITONITIS, NEONATAL, COMPLICATION (2978)
- RECTUM, ANATOMY, PELVIS (2318)

PERITONITIS
- GALLBLADDER, PERFORATION, AGED SUBJECTS (2916)

  - NEONATAL, COMPLICATION (2978)
- PHARYNX
  - PARASITOLOGY, WORM, ESOPHAGUS (3013)
  - ZENKER'S DIVERTICULUM, DIAGNOSIS, SURGERY (2750)
- PHOSPHATASE
  - ACID, SOLUBLE, MEMBRANE-BOUND, RAT, LIVER LYSOSOME (2278)*
  - ALKALINE, LIVER FUNCTION, BILIRUBIN, CHOLESTEROL, CONTRAST MEDIA (2465)
  - ALKALINE, PLACENTAL, INTESTINAL, MOLECULAR PROPERTIES (2291)
  - LIVER, RAT, RELEASE, LYSOSOME, SULFONAMIDE, SULFAPYRIDINE (2413)*
  - LIVER FUNCTION, ALCOHOLISM, GASTRITIS (2831)
- PHOSPHATE
  - LIVER, ENZYME, METABOLISM (2294)
- PHOSPHOFRUCTOKINASE ACTIVITY
  - THROMBOGENIC DIET, GLUCOLYSIS (2405)
- PHOSPHOLIPID
  - ENZYME, LIVER, MITOCHONDRIA (2286)*
  - LIPID, PHOSPHATIDYL GLYCEROL PHOSPHATE, SYNTHESIS, MITOCHONDRIA, MEMBRANE (2416)*
  - MITOCHONDRIAL MEMBRANE, COMPOSITION, LIVER (2270)*
  - PHOSPHATIDYLCHOLINE SYNTHESIS, LIVER, MITOCHONDRIA (2424)
- PHOSPHORYLATION
  - LIVER, GLUCAGON, HISTONE, INSULIN (2421)*
- PHYCOMYCOSIS
  - INTESTINE, ABDOMINAL WALL (2729)
- PLASMA MEMBRANE FRACTION
  - LIVER, ENZYME (2283)*
- PNEUMATOSIS INTESTINALIS
  - INTESTINE, GAS CYST, SURGICAL TREATMENT (2529)
- POLYCYSTIC DISEASE
  - HEPATO-RENAL (2848)
- POLYP
  - COLON, RECTUM, CANCER (2707)
  - RECTUM, CHILDREN (2723)
- POLYPOSIS
  - COLI, CARCINOMA, GENES (2930)
  - COLON, FAMILIAL, LYMPHOID HYPERPLASIUM, ILEUM (2669)
  - DETECTION, SIGMOIDOSCOPY (2499)*
  - GASTROINTESTINAL (2989)
  - LARGE INTESTINE, CARCINOMA, RESECTION (2737)
  - RECTUM, COLON, RADIOLOGY (2728)
- PORPHYRIA
  - CUTANEA TARDA, BIOPSY SMEARS, FLUORESCENT MICROSCOPY (2802)*
- PORTAL CIRCULATION
  - THROMBOSIS, ESOPHAGUS, BLEEDING, MESENTERIC INFARCTION, POLYCYTHEMIA VERA (2970)
- PORTAL HYPERTENSION
  - ANEURYSM, SPLENIC ARTERY (2979)
  - CIRRHOSIS, TREATMENT (2904)
- PORTAL VEIN
  - FISTULA, HEPATIC ARTERY, PATHOPHYSIOLOGY (2980)
- POTASSIUM
  - CONCENTRATION, MALARIA EFFECT, MONKEY (2273)*
  - SODIUM, MEDIUM, SMOOTH MUSCLE, CONTRACTION, ANOXIA (2475)
  - TAENIA COLI, CALCIUM, TENSION (2332)*
- POTASSIUM CHLORIDE
  - ULCER GASTRIC, HISTOLOGY (2655)
- PRECIPITIN
  - STOOL, GASTROINTESTINAL SENSITIVITY, DIARRHEA (2949)*
- PREGNANCY
  - ACUTE HEPATOSTEATOSIS (2827)
  - ANEMIA, THERAPY, IRON, FOLIC ACID (2813)
  - COMPLICATION, FIBROMA, COLON (2698)
  - DISEASE, GALLBLADDER, PANCREAS, SURGERY (2931)
  - GASTRIC ULCER, PERFORATION, STOMACH (2648)
  - RAT, LIVER, NUCLEOTIDE, ENZYME (2469)
- PROBE
  - MOUSSEAU-BARBIN'S, PALLIATIVE THERAPY, TUMOR, ESOPHAGUS (2579)
- PROLAPSE
  - GASTRIC MUCOSA, DUODENUM, RADIOLOGY, DIAGNOSIS (2592)
  - MUCOUS GASTROJEJUNAL, HEMORRHAGE, RESECTION, HEMATEMESIS, MELENA (2593)
- PROSTAGLANDIN E1
  - NOREPINEPHRINE, CIRCULATION, GASTRIC MUCOSA (2485)*
- PROTEIN
  - ACUTE PANCREATITIS, CHOLEPANCREATITIS, TRYPSIN, BLOOD (2787)
  - BILE, CHOLECYSTITIS, DIAGNOSIS (2915)
  - CALORIE, MALNUTRITION, KWASHIORKOR (2692)
  - CATABOLISM, GASTROINTESTINAL TRACT, X-RAY, MICE (2486)
  - CERULEIN, CHOLANGIOCYSTOGRAPHY, GUINEA PIG, CONTRAST MEDIA (2519)
  - CORE PARTICLE, RNA, RIBOSOME, RECONSTITUTION, LIVER, RATE (2310)
  - DRUG EFFECT, TRACER TECHNIQUE, ULCER (2488)
  - ENZYMATIC, ELECTROPHORETIC BEHAVIOR, X-RAY, LIVER, HEART, RAT (2431)
  - GLUTEN, WHEAT, RYE, CELIAC DISEASE, CHILDREN (2691)
  - GOLGI APPARATUS, LIVER, RAT (2297)
  - HEPARIN PROTEOGLYCAN, ISOLATION, LIVER CAPSULE, PIG (2303)
  - LIVER, RAT, TRACER TECHNIQUE, CELL CULTURE (2463)
  - LIVER, SOLUBLE, AZODYE CARCINOGENS, AMINO ACID RESIDUE, TRACER STUDIES (2406)*
  - LOSS, ENTEROPATHY, RETAINED INTESTINAL TUBE (2696)
  - LOSS, GASTROPATHY (2618)
  - STOMACH, CANCER, BLOOD (2589)
  - SYNTEHSIS, LIVER, SERUM ALBUMIN, SULFATE, ANABOLISM, TRACER STUDIES (2408)*
  - SYNTHESIS, RAT, RADIOLOGY, PARTIAL HEPATECTOMY, CELL CULTURE (2462)
- PRURITUS
  - ANUS, SURGERY (2726)

- SEUDOCYST
  - DIAGNOSIS, PANCREAS, SURGERY (2775)
  - PANCREAS, POSTTRAUMATIC, POSTPANCREATITIS, ANASTOMOSIS (2779)
- ULMONARY DISEASE
  - TRANSFER DEFECT, CELIAC DISEASE (2684)*
- URINE
  - SYNTHESIS, BRAIN, LIVER, RAT (2443)
- YLORIC STENOSIS
  - SKELETAL MUSCLE, WATER AND ELECTROLYTE CONTENT (2583)*
- YLOROPLASTY
  - DIARRHEA, VAGOTOMY, PEPTIC ULCER, GASTROJEJUNOSTOMY (2642)
  - RADIOLOGICAL ASSESSMENT, DUODENAL ULCER (2610)
- NA
  - POLYDISPERSE, NUCLEOPLASMIC, SYNTHESIS, ACTINOMYCIN D, LIVER, RAT, (2313)
- ADIOGRAPHY
  - STOMACH, TECHNETIUM, PERTECHNATE, RAT (2346)
- ADIOISOTOPE
  - 65ZN, NUCLEAR UPTAKE, LIVER (2425)
  - INDIUM, SCANNING AGENT (2526)
- ADIOLOGY
  - ACUTE APPENDICITIS (2754)
  - APPENDIX, SURGERY, PERFORATION (2713)
  - BARIUM ENEMA, COMPLICATION (2508)*
  - BILIARY TREE (2503)*
  - CANCER, ESOPHAGUS, DRUG EFFECT, SURGERY (2553)
  - CONTRAST MEDIUM, STORAGE, LIVER, LYMPHOGRAPHY, FOOT, HEPATOGRAPHY (2818)
  - DIAGNOSIS, GASTRIC MUCOSA, PROLAPSE, DUODENUM (2593)
  - DIAGNOSIS, OPISTHORCHOSIS, GALLBLADDER, MOTOR ACTIVITY (3003)
  - GASTROINTESTINAL TRACT, BRAIN TUMOR, PERISTALSIS, POSTOPERATIVE (2965)
  - LIVER, CANCER, VENOGRAPHY, METASTASES (2509)*
  - PARTIAL HEPATECTOMY, CELL CULTURE, RAT, PROTEIN SYNTHESIS (2462)
  - POLYPOSIS, RECTUM, COLON (2728)
  - RADIOPHONIC EMISSION, RADIOLOGIC APPEARANCE, GUT, CHILDHOOD (2988)
  - RECTUM, PERFORATION, BARIUM ENEMA (2702)
  - RECTUM, SIGMOID FLEXURE, HYPEREMIA, SPASM, TENESMUS, NEOPLASM, UTERUS, BLADDER, PAIN (2736)
  - STOMACH BIOPSY, DUODENAL BIOPSY, DIAGNOSIS (2523)
  - SURGERY, CANCER, ESOPHAGUS, BRONCHOESOPHAGEAL INVESTIGATION (2551)
- RECTUM
  - CANCER, DIAGNOSIS, SURGERY (2738)
  - CANCER, TREATMENT, POLYP (2707)
  - CARCINOMA, COLON, HEPATIC INFUSION (2730)
  - COLON, INJURIES, DIAGNOSIS, TREATMENT (2711)
  - COLON, POLYPOSIS, RADIOLOGY (2728)
  - CARCINOMA, SURGERY, POSTOPERATIVE (2739)
  - PERFORATION, BARIUM ENEMA, RADIOLOGY (2702)
  - PERITONEUM, ANATOMY, PELVIS (2318)
  - POLYPS, CHILDREN (2723)
  - PROSTATIC FISTULA, POSTOPERATIVE (2712)
  - TUBERCULOSIS, RECTO-ILEAL FISTULA, SURGERY (2705)
  - URETHRO-RECTAL FISTULA (2717)
- REFLUX
  - ESOPHAGITIS, CANCER, SURGERY, ESOPHAGOGASTRO-ANASTOMOSIS (2552)
  - ESOPHAGUS, HISTOLOGY (2549)*
  - GASTROESOPHAGEAL, SPHINCTER PRESSURE (2545)*
- REGENERATION
  - HEPATIC (2455)
- RESECTION
  - GASTRIC, HEMORRHAGE, SURGERY, ULCER (2598)
  - GASTRIC, MUCOUS GASTROJEJUNAL PROLAPSE, HEMATEMESIS (2593)
  - POLYPOSIS, LARGE INTESTINE, CARCINOMA (2737)
  - POST AORTIC, EROSION, HEMORRHAGE, ROENTGENOLOGY (2656)*
  - SMALL INTESTINE, MICROELEMENT, BLOOD (2661)
- RIBONUCLEASE
  - PANCREAS, ALKYLATION, BROMOACETATE (2306), (2307)
  - PRIMARY STRUCTURE, DISULFIDE BONDS, PANCREAS, PIG (2316)
- RIBONULEIC ACID
  - SYNTHESIS, WHOLE-BODY X-IRRADIATION (2423)
- RIBOSOME
  - LIVER, METABOLISM (2438)
  - PATTERN, LIVER, RAT, FETUS (2314)
  - RECONSTITUTION, LIVER, CORE PARTICLE, RNA, RAT (2310)
- ROUNDWORM
  - LIVER, INTESTINE (3012)
- SALICYLIC ACID
  - DERIVATIVES, ABSORPTION, TAURINE ANALOGUES, GASTROINTESTINAL TRACT, RAT (2350)
- SALMONELLA
  - TYPHOID FEVER, ANTIBIOTIC, CHILDREN (2976)
- SALMONELLOSIS
  - CHLORAMPHENICOL, AMPICILLIN, ANTIBODY RESPONSE (2974)
  - DISTAL ABDOMINAL AORTA, ANEURYSM (2993)
  - INTESTINE, DIAGNOSIS, INDIA (2973)
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GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabolic Diseases. This specialized information medium has been initiated to fill an existing great need in the field of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of the citations dealing with the major aspects of gastroenterology have accompanying abstracts.

The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great diversity of publications in the area of gastroenterology makes it imperative that an appropriate service be available t investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim is to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comment for consideration whenever possible.

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. For journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC,μC	milli-,microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10^{-9})
CNS	central nervous system	pg	picogram (10^{-12})
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
μg	microgram(s)		
hr	hour(s)	resp.	respectively
i.m.	intramuscular	Rev.	review (only in citations)
i.p.	intraperitoneal	RNA	ribonucleic acid
IU	international unit(s)	s.c.	subcutaneous
i.v.	intravenous	sec	second(s)
kg	kilogram(s)	SGOT	serum glutamic-oxalacetic transaminase
LD_{50}	median lethal dose(s)	SGPT	serum glutamic-pyruvic transaminase
LDH	lactic acid dehydrogenase	U	unit(s)
m	meter(s)	UV	ultraviolet
M	molar	WBC	white blood cells (leukocytes), white blood count
mEq	milliequivalent(s)		
mM	millimolar	yr	year(s)
μM	micromolar		

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

024 THE CELLULAR LOCALIZATION OF ENTEROKINASE. *(E.)* Nordstrom, C. (Chem. Ctr., U. Lund, weden) and A. Dahlqvist. *Biochem Biophys Acta* 98(3):621-622, 1970.

he localization of enterokinase acitivty (units/mg itrogen) within the duodenal wall of the rat was ualitatively studied by a cryostat cutting technique which allows the isolation of different parts f the villi and crypts by horizontal sectioning of resh frozen pieces of the intestinal wall. A unit f enterokinase was defined as the activity producing unit of trypsin per min. The highest specific citivities of enterokinase (0.017 units/mg nitrogen) ccurred in the apical halves of the villi and the ctivity decreased steeply towards the crypts. Within rypts and the Brunner glands of the duodenum, here was negligible enterokinase activity. pparently, enterokinase is a villous enzyme and ts function (as for other villous enzymes) is confined to the epithelial cells.

025 5-HYDROXYKYNURENINE DECARBOXYLASE IN RAT INTESTINE. *(E.)* Noguchi, T. (Wakayama ed. Coll., Japan), H. Kaseda, R. Kido and Y. atsumura. *J Biochem* 67(1):113-121, 1970.

homogenate of rat small intestine was found to atalyze the conversion of 5-hydroxykynurenine to -hydroxykynurenamine and 4,6-dihydroxyquinoline. he decarboxylase activity for 5-hydroxykynurenine as localized in the fraction (F-II) of small inestine precipitated by centrifugation at 700 to 000 x g and the decarboxylase activities of liver, idney and heart were mostly present in the mitochondrial fraction. The enzyme activity of F-II was ighly specific for 5-hydroxykynurenine (neither ynurenine, 3-hydroxykynurenine, tryptophan or 5-ydroxytryptophan could replace 5-hydroxykynurenine) nd could be determined without addition of monoamine oxidase to the incubation medium.

3026 APPENDIX AND γM-ANTIBODY FORMATION: I. IMMUNE RESPONSE AND TOLERANCE TO BOVINE γ GLOBULIN IN IRRADIATED, APPENDIX-SHIELDED RABBITS. *(E.)* Hanaoka, M. (Yale U. Sch. Med., New Haven, Conn.), K. Nomoto and B. H. Waksman. *J Immunol* 104(3):616-625, 1970.

Immunologic effects of and tolerance to injecting a protein antigen, bovine γ globulin (BγG) were studied in irradiated (900 R), bone marrow and appendix-shielded male New Zealand albino rabbits. I.V. injection of 200 μg. of alum-precipitated BγG into irradiated rabbits (shielded), gave rise to an early hemagglutinin response predominantly of the γM immunoglobulin type; responses were delayed in onset and of short duration. This effect was exaggerated by direct injection of antigen into appendiceal artery or into appendix lumen. Injection by either route of antigen freed of aggregated material by centrifugation gave little immune response and appeared to inhibit γM antibody formation on subsequent challenge with alum-precipitated antigen. Late formation of γG antibody and development of memory (ability to give early γG response after secondary challenge) were not affected by irradiation of appendix, but were inhibited in animals whose bone marrow was not shielded during irradiation. Two antibodies, γG and γM, seemingly are produced by different populations of cells: γM antibodies apparently are produced by cells in or derived from the appendix.

3027 INFLUENCE OF BILE ON THE CANINE GASTRIC-ANTRAL MUCOSA. *(E.)* Menguy, R. (Billings Hosp., Chicago, Ill.) and M. H. Max. *Amer J Surg* 119(2):177-182, 1970.

The influence of prolonged exposure (3 to 12 months) to bile (via biliary-antral anastomoses) on the morphology of the dog gastric-antral mucosa was studied by electron microscopy. After chronic exposure to the bile the antral mucosa was characterized by a marked increase in the number of mucosal folds and occasional polyp formation and there was no correlation between the duration of the biliary anastomoses and the severity of these changes, but there were no ulcerations, erosions, or mucosal hemorrhages. Microscopic changes included increases in mucosal, foveolar and glandular thickness (60, 77 and 38%, resp.), mitotic index (109%) and in the clear cells per crypt (122%), stratification of the epithelium lining the crypts, papillary infolding of the epithelium lining the foveolae, an increase in branching of the antral glands, follicular lymphoid hyperplasia with marked distortion of the glandular architecture, and heavy round cell infiltrate in the foveolar layer of the mucosa.

3028 ULTRASTRUCTURAL HEPATIC CHANGES FOLLOWING THE ADMINISTRATION OF BENZYLIDENEYOHIMBOL. *(E.)* De La Iglesia, F. A. (Warner-Lambert Res. Inst. Canada, Ontario), J. C. Sosa-Lucero and G. Lumb. *Toxic Appl Pharmacol* 16(1):239-255, 1970.

Morphological ultrastructural hepatic changes following administration of benzylideneyohimbol (potential non-steroid, anti-inflammatory) were studied in male, Wistar rats and purebred beagle dogs. Administration of benzylideneyohimbol (30 mg/kg of body weight daily for rats; 60 mg/kg in gelatin capsules, daily for dogs) together with nutritionally adequate diet, did not induce light microscopic or biochemical changes in liver of either animal group. After 4, 8, and 16 weeks of drug administration to rats, mitichondrial changes appeared at 4 weeks and were present at 8 and 16 weeks also. Bizarre-shaped organelles were found to be exclusively located in central areas of liver lobule. In dogs after 12 weeks of drug administration, hepatocytes also evidenced peculiar mitochondrial forms; the mitochondrial aberrations were located in peripheral zones of liver lobules. Other cytoplasmic changes, including smooth endoplasmic reticulum hypertrophy, were observed in both species. Morphological alterations found seemingly represent basic compensatory mechanisms aimed to support more fundamental cellular processes rather than the preservation of organelle architecture.

3029 A METHOD FOR QUANTITATION OF PROLIFERATIVE INTESTINAL MUCOSAL CELLS ON A WEIGHT BASIS: SOME VALUES FOR C57BL/6. *(E.)* Hagemann, R. F. (Allegheny Gen. Hosp., Pittsburgh, Penn.), C. P. Sigdestad and S. Lesher. *Cell Tiss Kinet* 3(1):21-26, 1970.

A method for determining the number of small intestinal mucosal crypts, S cells, and total proliferative cells on a weight basis in the mouse is presented. Following the injection of tritiated thymidine, the number of crypts was determined by dividing the disintegrations per min per mg of intestine by the disintegrations per min per crypt and the number of S cells per mg of intestine was determined by multiplying the number of crypts per mg by the number of labeled cells per crypt (which were determined autoradiographically). The number of proliferative cells per mg intestine was determined by dividing the number of S cells per mg by the fraction of proliferative cells in S cells (as obtained by cell cycle analysis). The mean values for the entire mouse intestine were: 1094 mg wet weight, 1.1×10^6 crypts, 1.0×10^8 S cells, and 1.8×10^8 proliferative cells.

3030 DISTRIBUTION AND PROPERTIES OF ALKALINE PYROPHOSPHATASES OF RAT LIVER. *(E.)* Irie, M. (Fac. Pharmaceut. Sci., Kyoto U., Japan), A. Yabuta, K. Kimura, Y. Shindo and K. Tomita. *J Biochem* 67(1):47-58, 1970.

The subcellular distribution of alkaline inorganic pyrophosphate phosphohydrolase and the presence of two electrophoretically different enzymes in mitochondria were studied in rat liver. Inorganic pyrophosphate phosphohydrolase activities found in purified nuclei and lysosomes were accounted for by contaminating mitochondria. All three enzymes were partially purified and exhibited an optimum activity at pH of 8 and an estimated molecular weight of 68,000, The enzymes were activated by Mg^{++}, were markedly inhibited by Zn^{++}, Mn^{++}, Hg^{++}, Cd^{++}, Ca^{++} and F^-, and were unstable to air oxidation and stabilized in the presence of cysteine. The three isoenzymes were different with regard to the effect of Mg^{++} substrate specificity and inactivation by urea. Excess Mg^{++} was inhibitory to all enzyme activity, and this inhibition was more pronounced with the cytosol enzyme. The cytosol enzyme was specific for pyrophosphatase hydrolysis while mitochondrial enzymes also hydrolyzed nucleoside polyphosphates. The urea concentrations required for 50% inactivation were 1.2M for the cytosol enzyme and 2M for the mitochondrial enzymes.

3031 RENEWAL OF GOBLET AND PANETH CELLS IN THE SMALL INTESTINE. *(E.)* Cairnie, A. B. (Dept. Biol., Queen's U., Kingston, Ontario, Canada). *Cell Tiss Kinet* 3(1):35-45, 1970.

The mechanism of renewal of goblet cells and Paneth cells in the small intestine was studied by autoradiography in male and female rats injected with ^3H-thymidine at various time intervals before sacrifice (one group of animals received a single i.p. injection of labeled thymidine and the other received repeated injections before sacrifice). Both goblet and Paneth cells are non-proliferative cell populations which are renewed by differentiation from a precursor cell type. Goblet cells had a turnover time in the crypt of 40 hr and migrated to the villus in about the same time as taken by the columnar cells The turnover rate of Paneth cells was slower than that of goblet cells. The precursor of the goblet cell seemingly is found among the columnar cells in the lower part of the crypt and the precursor of Paneth cells may be situated outside the mucosal epithelium.

3032 ENZYME HISTOCHEMISTRY AND HORMONES OF THE DEVELOPING GASTROINTESTINAL TRACT OF THE CHICK EMBRYO: III. ENTEROCHROMAFFIN CELLS -- THEIR POSSIBLE PRODUCTS, GLUCAGON, 5-HYDROXYTRYPTAMINE AND THE RELATION OF MONOAMINE OXIDASE. *(E.)* Baxter-Grillo, D. L. (Dept. Anat., U. Ibadan, Nigeria). *Histochemie* 21(2):129-135, 1970.

In Rhode Island Red chicken embryos, argentaffin granulations were present in the epithelial cells of the small intestine from the 6th day of incubation, and were numerous by the 19th day, when some were also present in the submucosa; in the stomach-complex they were present by the 8th day. Using fluorescent-labeled antiglucagon sera, glucagon was found in the developing gastrointestinal tract on the 12th day. Monoamine oxidase activity was demonstrated histochemically from the 6th day in epithelial cells of the stomach-complex and intestine and assay of monoamine oxidase activity using C^{14} labeled 5-hydroxytryptamine showed fluctuating enzyme activity from the 10th day until hatching. A possible relation may exist between monoamine oxidase activity and serotonin-producing cells.

3033 ULTRASTRUCTURAL LOCALIZATION OF GASTRIC PARIETAL CELL ANTIGEN WITH PEROXIDASE-COUPLED ANTIBODY. *(E.)* Hoedemaeker, P. J. (Harvard Med. Sch., Boston, Mass.) and S. Ito. *Lab Invest* 22(2):184-188, 1970.

An attempt was made to localize antigen in the human gastric parietal cell at an ultrastructural level. Anti-parietal cell antibodies from the sera of pernicious anemia patients were coupled to horseradish peroxidase and then were reacted with human gastric mucosa and with the parietal cells of rat, mouse, guinea pig and hog. Cryostat sections of fixed human gastric mucosa were incubated in a medium containing the peroxidase coupled antibodies, 3,3'-diaminobenzidine (DAB) tetrahydrochloride (75 mg/100 cc) and 0.001 per cent hydrogen peroxide. Peroxidase activity (demonstrating the sites of bound antibody) was located in or on the cell membrane forming the microvilli of the gastric parietal cell (other gastric epithelial cells did not show peroxidase activity). When the tissues were incubated in 3,3'-diaminobenzidine for more than 30 min, a dense reaction was observed in the mitochondria, due to endogenous cytochrome oxidase activity. A cross reaction with parietal cell microvilli of the rat, ouse, guinea pig and hog was observed, but there as no cross-reaction with the epithelial cells of he frog stomach.

034 ULTRASTRUCTURE OF PANCREATIC ACINAR AND ISLET PARENCHYMA IN RATS AT VARIOUS IN-ERVALS AFTER DUCT LIGATION. (*E.*) Boquist, L. (Inst. ath. II, U. Umea, Sweden) and C. Edstrom. *Virchows rch Path Anat* 349(1):69-79, 1970.

he effect of pancreatic duct ligation on ultra-tructural degenerative and regenerative changes in he exocrine and endocrine pancreas was studied (by ight microscopy) in 14 female Sprague-Dawley rats, nd these changes were compared with those evoked in he pancreatic parenchyma following administration f ethionine or excess methionine. The animals were bout two months old and weighed 200 gm at the time f pancreatic duct ligation, and were sacrificed at he following time intervals after duct ligation: , 3, 5 days, 1, 2, 3, 4, 6 weeks, and 6 months. uct ligation of the rat pancreas evoked degeneration nd atrophy of the acinar cells, and the atrophied arenchyma was replaced by adipose and fibrous tissue there was no regeneration of acinar cells). The slet β cells showed degranulation and a prominent ndoplasmic reticulum and Golgi complex the first ive days following ligation and there were degenera-ive changes and necrosis in some β cells, but he other islet parenchymal cells showed no obvious esions. The ductules appeared to proliferate and howed mitosis and buds composed of agranular and ranulated cells which appeared to develop into is-ets. The agranular cells were numerous in the uctules and islets particularly at 1, 2 and 3 weeks.

035 EFFECT OF COLCHICINE ON INTESTINAL DISACCHARIDASES: CORRELATION WITH BIO-HEMICAL ASPECTS OF CELLULAR RENEWAL. *(E.)* erbst, J. J. (Stanford U. Sch. Med., California), . Hurwitz, P. Sunshine and N. Kretchmer. *J Clin nvest* 49(3):530-536, 1970.

istar rats were given colchicine (2.5mg/100ml of rinking water or 4-5 mg/kg/day) and the intesti-al mucosa was examined biochemically for lactase, nvertase, maltase, alkaline phosphatase, aspartate ranscarbamylase, and dihydroorotase activities, nd histologically to determine whether colchicine ffects disaccharidase activities primarily through ellular renewal in the crypts or directly on the ifferentiated cells of the villus. Maltase, spartate transcarbamylase and dihydroorotase ctivities were not affacted by colchicine while actase activity decreased by 80% (10.5 units to), invertase by 40% (59 units to 33), and alkaline hosphatase by 40% (270 units to 160) (these acti-ities returned to normal within 48 hr after olchicine was removed from the drinking water). *n vitro*, colchicine up to 125 mg/100 ml did not affect invertase and maltase activities but at mg/100ml inhibited lactase activity. Histologi-cally, colchicine-treated animals had increased rypt cells (from 36 to 48 cells/crypt), cellular igration along the villi, and increased uridine inase activity, but no change in the length of villi. Colchicine (in a small constant dose) directly affects the differentiating cells of the villus causing a decrease in some disaccharidase activity.

3036 A MICRO-TECHNIQUE FOR THE ASSAY OF INTESTINAL ALKALINE PHOSPHATASE: RESULTS IN NORMAL CHILDREN AND IN CHILDREN WITH CELIAC DISEASE. *(E.)* Hamilton, J. R. (Hosp. Sick Child., Toronto, Canada) and M. H. Kelly. *Clin Biochem* 3(1):33-43, 1970.

A simple quantitative micro method is described for the determination of alkaline phosphatase activity in whole homogenates of intestinal mucosal tissue employing the enzymatic hydrolysis of p-nitorphenyl phosphate. Optimal conditions for assay of human intestinal alkaline phosphatase at 30°C were found to be 0.75 mol 2-amino-2-methyl-1-propanol buffer, pH 10.0, 5 mmol/liter substrate, and 50 µliter sample volume. Precision of the method was 18.0 ± 0.9 U/ml on 10 within-day replicates of calf intestinal alkaline phosphatase, electrophoretically purified. Using duodenal biopsy tissue, alkaline phosphatase activity was decreased significantly in a group of 8 children with celiac disease when compared with a group of 10 normal children.

3037 IMMUNOFLUORESCENT LOCALIZATION OF THE GASTRIN-SECRETING G CELLS IN THE PYLORIC ANTRUM OF THE PIG. *(E.)* Bussolati, G. (Inst. Path. Anat., U. Turin, Italy) and A. G. E. Pearse. *Histochemie* 21(1):1-4, 1970.

An indirect immunofluorescence technique, using anti-human gastrin serum, was applied to formalin-fixed, paraffin-embedded material from the antral tissues of porcine stomach. The results were photographed, and post-fixation in formalin was followed by the Grimelius silver technique. The argyrophil G cells were situated in the middle portion of the pyloric glands, showed a positive gastrin immunofluorescence, were oval or pyramidal in shape, and were easily distinguished from the yellow fluorescing enterochromaffin cells. Some weakly fluorescent cells failed to stain by the silver technique, indicating that this technique is less sensitive than immunofluorescence since it depends on the presence of granular storage product. The argyrophil G cells of the pyloric antrum were shown to be the gastrin-containing cells.

3038 ANOXIC AND SECRETORY VACUOLATION IN THE ACINAR CELLS OF THE PANCREAS. *(E.)* Tapp, R. L. (Physiol. Lab., Cambridge, England). *Quart J Exp Physiol* 55(1):1-15, 1970.

Vacuoles, 2-20 microns in diameter, develop in the acinar cells of the rat pancreas when small cubes ($2mm^3$) of tissue are incubated for 1 hr at 20°C in unoxygenated media such as Tyrode's solution or rat's serum. For vacuolation to occur the cells must be anoxic and have access to excess fluid containing Ca^{2+} and either Na^+ or Li^+. The vacuoles are bounded by a membrane and develop from or near the Golgi complex. Vacuolation is prevented if the medium is cooled to 0°C, if 270 m-osmoles of sucrose, glucose or glycerol is added to the medium, or if the essential cations are not available; it is not prevented by the addition of 270 m-osmoles of urea or propylene glycol, by the addition of poisons which block oxidative phosphorylation or glycolysis, or by substituting Li$^+$ for Na$^+$. Vacuolation can be increased by allowing the tissue to stand at 20°C for 15 or 30 min before immersion in a suitable medium. Vacuolation apparently involves two distinct, passive movements of fluid; first, from the external medium into the cytoplasmic matrix, and then from the matrix into the vacuoles. The second movement appears to involve the enzymic breakdown of large, precursor molecules in some part of the Golgi complex.

3039 FRACTIONATION OF LIVER PLASMA MEMBRANES PREPARED BY ZONAL CENTRIFUGATION. *(E.)* Evans, W. H. (Natl. Inst. Med. Res., London, England). *Biochem J* 166(5):833-942, 1970.

Plasma membranes were isolated from crude nuclear sediments from mouse and rat liver by a rate-dependent centrifugation through a sucrose density gradient contained in the 'A' type zonal rotor. When the plasma-membrane fraction of sucrose density 1.17 g/cm^3 was dispersed in a tight-fitting homogenizer, 2 subfractions of densities 1.12 and 1.18 were obtained by isopycnic centrifugation. The light subfraction contained 5'-nucleotidase, nucleoside diphosphatase, leucine naphthylamidase and Mg^{2+}-stimulated adenosine triphosphatase activities at higher specific activities than unfractionated membranes. The heavy subfraction was deficient in these enzymes but contained higher Na$^+$-plus-K$^+$-stimulated adenosine triphosphatase activity. The light subfraction contained twice as much phospholipid and cholesterol, and 3 times as much N-acetylneuraminic acid relative to unit protein weight as the heavy subfraction. Polyacrylamide-gel electrophoresis indicated differences in protein composition. Electron microscopy showed the light subfraction to be vesicular (vesicles probably derived from the microvillar surfaces of the bile canaliculi) while the heavy subfraction contained membrane strips with junctional complexes (probably derived from areas in contact with neighboring parenchyma cells) in addition to vesicles.

3040 DEVELOPMENT OF FECAL IMMUNOGLOBULINS AND COPROANTIBODIES IN INFANTS AFTER ARTIFICIAL ORAL COLONIZATION WITH *E. COLI 083. (E.)* Lodinova, R. (Inst. Care Mother Child, Prague, Czechoslovakia) and V. Wagner. *Experientia* 26(2): 188, 1970.

Coproantibody production was studied in 5 new-born infants following artificial colonization with *E. coli* type 983 (administered p.o. 5 x 10^8 organisms/ml, immediately after birth and then 3 times a week for 3 weeks). Blood and stool samples were taken every 2 weeks after colonization for a 25-week period, and antibodies were measured in stool filtrates and in serum specimens using passive hemagglutination. The first immunoglobulins found in the stool samples were IgA and IgM (IgG was not demonstrated). Hemagglutinating antibody against *E. coli* 083 antigen was present in stool and serum in titers from 1:2 to 1:128 and a random infection with *Proteus* was followed by appearance of hemagglutinating antibody against the O antigen of the *E. coli* 083 in stool filtrates of 2 infants.

3041 RAPID LOSS OF CYTOCHROME *P*-450 AND HAEM CAUSED IN THE LIVER MICROSOMES BY THE PORPHYROGENIC AGENT 2-ALLYL-2-ISOPROPYLACETAMIDE. *(E.)* De Matteis, F. (Med. Res. Counc., Carshalton, Surrey, England). *FEBS Letters* 6(4):343-345, 1970.

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3043 SPECIAL STRUCTURAL FEATURES OF THE RAT PORTAL VEIN. *(E.)* Ts'ao, C. H. (Pritzker Sch. Med., U. Chicago, Ill.), S. Glagov and B. F. Kelsey. *Anat Rec* 166(3):529-532, 1970.

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3045 THE RAT HEPATOCYTE AFTER EXPOSURE TO HIGH ALTITUDE: STRUCTURAL AND CHEMICAL CHANGES. *(E.)* Burgos, M. H. (Fac. Med. Sci., U.N.C., Mendoza, Argentina), E. O. Zangheri and I. M. Parisii. *Quart J Exp Physiol* 55(1):54-58, 1970.

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- P:Absorp (3112) (3115)
- P:Secr:Stom (3146)
- P:Morph (3162) (3181) (3183) (3191) (3200) (3203) (3214) (3216) (3218) (3220) (3221) (3222)
- P:Secr:Int (3226)
- Diagproc (3280) (3311)
- [illegible]ph (3312)

- D:S.Intest (3416)
- D:S.Intest:Malabs (3437) (3440)
- D:L.Intest (3497) (3503)
- D:Pancreas (3522)
- D:Livbil (3549) (3557) (3565) (3566) (3576) (3577) (3579) (3580) (3581) (3588) (3590)
- D:Livbil:A.Nonv.Hep (3592) (3596) (3598) (3603) (3608) (3615) (3617) (3619) (3620) (3621) (3622) (3623)
- D:Livbil:A.V.Hep (3624) (3626) (3636)
- D:Livbil:C.Hep (3644)
- D:Livbil:Gallb (3661) (3663) (3670) (3674) (3675) (3679) (3685)
- D:Gen (3707) (3736)
- D:Gen:Parasit (3784)

ABSORPTION—EXCRETION—TRANSPORT

3094 INTERRELATIONSHIPS OF CHLORIDE, BICARBONATE, SODIUM AND HYDROGEN TRANSPORT IN THE HUMAN ILEUM. *(E.)* Turnberg, L. A. (Manchester Roy. Infirm., England), F. A. Bieberdorf, S. G. Morawski and J. S. Fordtran. *J Clin Invest* 49(3):557-567, 1970.

A triple-lumen constant perfusion system was used to study the aspects of ileal transport mechanisms in normal male and female volunteers, aged 21 to 35 yr. Chloride, bicarbonate and sodium ions exhibited net movements across ileal mucosa against electrochemical gradients and during perfusion with a balanced electrolyte solution simulating plasma, the ileum usually absorbed, but sometimes secreted fluid. When sodium movement was zero, there was a reciprocal net movement of chloride and bicarbonate, and increasing rates of sodium absorption were associated with decreasing bicarbonate secretion rates and decreasing bicarbonate absorption. Net chloride movement was sensitive to bicarbonate concentration in ileal fluid; chloride was absorbed from solutions containing 14 or 44 mEq/liter of bicarbonate, but was secreted when ileal fluid contained 87 mEq/liter of bicarbonate. Infusion of sulfate solutions (chloride-free) resulted in ileal absorption of sodium bicarbonate and acidification of ileal contents to pH values between 6.94 and 7.16, from normal values of 7.3 to 7.6. Neither infusion of plasma-like fluids nor replacement of chloride with sulfate in the perfusion solution caused any significant change in potential difference (-9 mV) between skin and ileal lumen. Ileal electrolyte transport seemingly occurs by a simultaneous double exchange involving Cl/HCO_3 and Na/H and neither the anion nor the cation exchange app[illegible] causes net ion movement.

3095 EFFECT OF AGE OF RAT ON DEVELOPMENT OF HEPATIC CARRIERS FOR BILIRUBIN: A POSSIBLE EXPLANATION FOR PHYSIOLOGIC JAUNDICE AND HYPERBILIRUBINEMIA IN THE NEWBORN. *(E.)* Grodsky, G. M. (U. California Med. Ctr., San Francisco), H. J. Kolb, R. E. Fanska and C. Nemechek. *Metab Clin Exp* 19(3):246-252, 1970.

A method for measuring the level of carrier proteins (which bind bilirubin and sulfobromophthalein (BSP)) in hepatic cytosol based on the competitive binding of either pigment between the carrier proteins and the highly cross-linked dextran particles in Sephadex G-10 was used to demonstrate the functional immaturity of the protein carrier system in the liver of fetal and newborn Wistar [illegible]. Cytosol from liver, kidney, spleen and muscle of rats was collected two days pre-partum at regular intervals to 120 days post-partum. Most binding activity was found in adult rat liver which contained 7 to 10 times that of the adult brain, kidney, spleen or muscle. Binding activity in fetal rat liver was 25-35% of the adult level for either bilirubin or BSP. High concentrations of BSP displaced bilirubin from the carrier proteins which indicated common binding sites and a large capacity for adult liver to bind both pigments. The immaturity of a carrier system for bilirubin in the newborn rat may partially explain the physiologic jaundice and hyperbilirubinemia observed in newborn humans.

3096 CHOLESTEROL ABSORPTION FOLLOWING REVERSAL OF THE UPPER AND LOWER HALVES OF THE SMALL INTESTINE. (*E.*) Gebhard, R. L. (U. Minnesota Med. Sch., Minneapolis) and H. Buchwald. *Surgery* 67(3): 474-477, 1970.

Ten white New Zealand 6 to 8 pound rabbits were prepared by surgically interchanging the distal and proximal halves of small intestine. "Absorptive capacity" (defined as average whole blood cholesterol radioactivity following forced feeding of 10 mg of cholesterol-4-^{14}C) was 2,272 cpm/ml with the 10 operated animals—essentially identical to the 2,458 count with 10 weight and sex-matched normal control rabbits. The average whole blood cholesterol concentration of the operated animals was 86.9 mg% compared with the control animals at 91.4 mg%, not a statistically significant difference. Thus, reversal of the continuity of jejunal and ileal segments resulted in no change in total cholesterol absorption. There does not appear to be an ileal or jejunal site in the small intestine of the rabbit which is specific or selective for cholesterol absorption. Any relative difference is attributable to the time necessary to prepare cholesterol for absorption, so that whichever segment is distal will be responsible for the major share. Transit time in the small intestine seems to significantly influence quantitative cholesterol absorption.

3097 ON THE *IN VITRO* "ACTIVE TRANSPORT" OF ALDOPENTOSES BY THE RAT JEJUNUM. (*E.*) Bell, D. J. (U. Med. Sch., Edinburgh, Scotland). *Quart J Exp Physiol* 55(1):59-63, 1970.

Everted jejunal sacs of adult rats were used in this study of 'active transport' of aldopentoses at low concentrations (9 to 40 μg/ml) under *in vitro* aerobic conditions. Using D-xylose, in all jejunal preparations (9) active transport was observed; while in all of 3 experiments the presence of D-glucose in greater amounts (100 μg/ml) than xylose completely prevented the appearance of extra aldopentose on the serosal side of the preparations. No pentose other than xylose was detected chromatographically on the serosal side. In all experiments using L-arabinose (9) and D-ribose (3) no transport was observed.

3098 UPTAKE OF DRUGS BY NORMAL AND DISEASED HUMAN GASTRIC MUCOSA: *IN VITRO* EXPERIMENTS WITH LABELED ACETYLSALICYLIC ACID AND THIOPENTONE. (*E.*) Jussila, J. (Helsinki U. Central Hosp., Finland), O. Mustala, G. Kvist and M. Siurala. *Arch Int Pharmacodyn* 183(2):270-276, 1970.

The *in vitro* uptake of ^{14}C-acetylsalicylic acid and ^{35}S-thiopentone by human esophageal, gastric and intestinal biopsy specimens was studied at different pH's of the incubation medium. The uptake of both drugs was significantly higher at pH 3-3.8 than at pH 7-8.4, with a distribution ratio of 2 to 7 at pH 3-3.8 and about one at pH 7-8.4. At pH 3.8 the uptake of ^{14}C-acetylsalicylic acid by atrophic gastric mucosa was significantly lower than that by a normal mucosa while no corresponding difference between the atrophic and normal gastric mucosa was observed with ^{35}S-thiopentone. In a dissociated form these drugs seemingly are passively taken up by diffusion into the specimens, while at lower pH's and being in lipid-soluble state, the concentration of the drugs in the specimens is higher than that in the medium suggesting the increased metabolic rate or the binding of the drugs to mucosal proteins.

3099 EFFECT OF AGE ON INTESTINAL ABSORPTION OF RIBOFLAVIN IN HUMANS. (*E.*) Levy, G. (Sch. Med., State U. New York, Buffalo), W. J. Jusko and S. J. Yaffe. *J Pharm Sci* 59(4):487-490, 1970.

Thirteen male and 10 female healthy human subjects (ages 3 months to 40 yr) received a p.o. dose of 150 mg/m^2 body surface area of riboflavin-5'-phosphate (absorbed specifically in the proximal small intestine). The urinary recovery of the vitamin increased significantly (from 6% to 12% of the dose) over this age range and the ratio of maximum excretion rate to dose and the time of occurrence (of maximum excretion rate) were independent of age. The kinetics of riboflavin elimination also did not show any appreciable change with age. Prompt release of drugs from pharmaceutical dosage forms to assure absorption seemingly is even more important in young children than in adults because of the apparently shorter residence time of such drugs at intestinal absorption sites.

3100 MECHANISM OF BICARBONATE ABSORPTION AND ITS RELATIONSHIP TO SODIUM TRANSPORT IN THE HUMAN JEJUNUM. (*E.*) Turnberg, L. A. (U. Texas Southwestern Med. Sch., Dallas), J. S. Fordtran, N. W. Carter and F. C. Rector, Jr. *J Clin Invest* 49(3):548-556, 1970.

Sodium and bicarbonate absorption was studied in human subjects by the Ingelfinger triple-lumen constant perfusion technique. The rate of sodium absorption was markedly influenced by bulk water flow; when the net water flow was zero, sodium absorption was zero if there were no concentration gradients between plasma and lumen that favored net NaCl diffusion. The potential difference between abraded skin and jejunal lumen was near zero when saline was perfused and did not change with partial substitution of sulfate or bicarbonate for chloride. The mechanism of the link between bicarbonate and sodium absorption was studied in normal subjects and in 11 patients with pernicious anemia (the latter were chosen because they did not secrete gastric juice which could react with bicarbonate in the jejunal lumen). Bicarbonate absorption occurred against steep electrochemical gradients, did not generate a potential difference between abraded skin and jejunal lumen, was inhibited by acetazolamide, and generated a high CO_2 tension in jejunal fluid. Bicarbonate absorption seemingly is mediated by active hydrogen secretion, rather than by bicarbonate ion transport per se, and the link between sodium and bicarbonate transport may best be explained by a sodium-hydrogen exchange process.

3101 BILIRUBIN ABSORPTION BY THE GALLBLADDER.

(E.) Royer, M. (Natl. Inst. Hlth., Haedo, Argentina), H. Ortiz, E. Machado and B. Noir. *Scand J Gastroent* 5(1):17-23, 1970.

The absorption of conjugated and unconjugated bilirubin-^{14}C (with bile) after infusion into the gallbladder or jejunum was studied in dogs with cannulated gallbladder and common bile duct. About 2.9 to 23.5% of a total dose of 41.66 mg of conjugated bilirubin-^{14}C and 0-0.3 mg% of a total average dose of 7.9 mg of unconjugated bilirubin-^{14}C were recovered in the cholecystic bile after 8 hr. When labeled bile (from which most of the bilirubin had been precipitated out) was infused into the gallbladder and jejunum, about 27.7% and 2%, resp., of the total radioactivity infused were recovered from the hepatic bile. Small amounts of bilirubin-^{14}C were consistently found in blood and urine 8 hr after injection of labeled bile into the gallbladder. Both conjugated and unconjugated bilirubin-^{14}C apparently are absorbed by the gallbladder, transported into the general circulation, and eliminated in the bile and urine, indicating a cholecystohepatic circulation of bilirubin.

3102 GASTRIC ABSORPTION AND DISTRIBUTION OF ACETYLSALICYLIC ACID AND OTHER ACIDIC COMPOUNDS IN THE RAT.

(E.) Morris, C. H. (Sch. Pharm. Pharmacol. Sci., Purdue U., Lafayette, Ind.), J. E. Christian, T. S. Miya and W. G. Hansen. *J Pharm Sci* 59(3):325-329, 1970.

The gastric absorption and distribution of sodium acetylsalicylate-7-^{14}C was compared with the absorption and distribution of sodium salts and other weakly acidic compounds from the rat stomach. Acetylsalicylic acid was the one compound tested that produced lesions in the gastric mucosa, although the other compounds tested (radioactive sodium benzoate, sodium acetate, and sodium barbital) had similar absorption patterns. The gross autoradiographs and quantitative data showed that sodium acetylsalicylate, sodium benzoate and sodium barbital concentrations within the corpus of the stomach drop to less than 0.01 μmoles/gm of tissue within 2 hr, but remain at relatively high concentrations (0.01 to 0.1 μmoles/gm of tissue) in the rumen portion. Autoradiographic localization and tissue analysis showed that sodium acetate rapidly disappears (less than 0.001 μmoles/gm of tissue) in 2 hr from both the rumen and corpus. Absorption characteristics of acetylsalicylic acid and its salts may be associated with their ability to cause gastric ulcers.

3103 THE SITE OF ABSORPTION OF CHOLESTEROL AND SITOSTEROL IN THE RAT SMALL INTESTINE.

(E.) Sylven, C. (Chem. Ctr., Lund, Sweden) and C. Nordstrom. *Scand J Gastroent* 5(1):57-63, 1970.

Cholesterol-4-^{14}C and sitosterol-22,23-^{3}H were administered intragastrically (in micellar solution) or intraduodenally (dissolved in triolein) to male rats in order to determine the morphological site of uptake of these 2 sterols along the small intestine and in the intestinal villi and crypts. Sterols were uniformly taken up by the proximal (micellar solution) or by the middle part (triolein solution) of the small intestine. The apical halves of the villi contained the major amount of the sterols taken up; the 2 sterols had identical areas of uptake. With the micellar solution, the uptake was maximal after 15 min postadministration; with the triolein solution, absorption was maximal after 6 hr.

3104 ABSORPTION OF ACETYLSALICYLIC ACID FROM UNBUFFERED AND BUFFERED GASTRIC CONTENTS.

(E.) Hunt, J. N. (Guy;s Hosp. Med. Sch., London, England) and A. R. Cooke. *Amer J Dig Dis* 15(2):95-102, 1970.

The rate of gastric emptying and absorption of acetylsalicylic acid was studied in 19 healthy subjects after the administration of a 200 ml test meal containing 1250 mg/liter of unbuffered acetylsalicylic acid or 3100 mg/liter of buffered acetylsalicylate. The volume of test meal containing unbuffered acetylsalicylic acid was greater than that containing buffered acetylsalicylate at 5 and 10 min after administration in 18/19 subjects. Neither blood clots nor blood staining were observed in the gastric contents after a test meal containing buffered acetylsalicylate or unbuffered acetylsalicylic acid. The mean pH of test meals containing buffered acetylsalicylate before ingestion was 7.0 and for the test meals containing unbuffered acetylsalicylic acid was 2.8. At the end of 10 min. 69% of the buffered and 52% of the unbuffered meal had emptied from the stomach and the mean pH values of the gastric contents after ingestion of the buffered meals at 5, 10, 15, and 20 min were 6.5, 6.3, 5.8, 5.3, resp., and for the unbuffered meals the mean pH of gastric contents after 5 and 10 min was 2.3 and 2.0, resp. The mean percentage absorption of acetylsalicylic acid at 10 min for the buffered solutions (8%) was significantly less than that for the unbuffered solutions (11.6%).

3105 THE SODIUM-ALANINE INTERACTION IN RABBIT ILEUM: EFFECT OF SODIUM ON ALANINE FLUXES.

(E.) Hajjar, J. J. (Yale U. Sch. Med., New Haven, Conn.), A. S. Lamont and P. F. Curran. *J Gen Physiol* 55(3):277-296, 1970.

The interaction (Model of Curran) between sodium and alanine at the mucosal border of rabbit ileum was tested by examining the efflux of alanine from the cells both directly (with ^{14}C-alanine as tracer) and indirectly (method of Curran, Herrera, and Flanigan). As cellular alanine concentration increases (from 0 to 40mM), the efflux tends toward saturation and is influenced by cellular sodium concentration because the "apparent Michaelis constant" (K_t) increases as sodium concentration decreases (K_t increases from 55 to 80 as [Na]decreases from 140mM to 0). The direction of the sodium concentration difference determines the direction of net alanine transfer between the cells and medium: when cell [Na] > medium [Na], the cells extrude alanine against a concentration difference and accumulate it when cell [Na] < medium [Na]. Data support the hypothesis that a transport site combining with and translocating both Na and alanine exists and that a sodium concentration difference between cell and medium provide energy for the active transport of alanine.

3106 THE SODIUM-ALANINE INTERACTION IN RABBIT ILEUM: EFFECT OF ALANINE ON SODIUM FLUXES. *(E.)* Curran, P. F. (Yale U. Sch. Med., New Haven, Conn.), J. J. Hajjar and I. M. Glynn. *J Gen Physiol* 55(3):297-308, 1970.

The interaction between sodium and alanine transfer across the mucosal border of rabbit ileum was studied by examining the effect of alanine on sodium movement (quantitated by flame photometry and ^{22}Na tracer) in mucosal strips and whole intestinal wall. When mucosal strips were incubated with 40mM alanine and then transferred to an alanine-free medium, cell sodium content decreased (0.6μEq/mg) from the control value (0.76μEq/mg), but when incubated in alanine-free medium and then transferred to a 40 mM alanine solution, cell sodium concentration increased (0.68μEq/mg) from the control value (0.6μEq/mg). Sodium efflux from the cells increased by an average of 11% when the cells were loaded with alanine. The relation between the increment in sodium and alanine efflux agrees with the model of Curran for the sodium-alanine interaction at the mucosal border of the cells.

3107 EFFECT OF METOCLOPRAMIDE ON TRANSPORT IN THE SMALL INTESTINE OF THE DOG. *(E.)* Tinker, J. (Roy. Postgrad. Med. Sch., London, England) and Alan G. Cox. *Gut* 10(12):986-989, 1969.

The dye dilution method described for the simultaneous measurement of flow rate, mean transit time, and volume of the jejunum during the transport of fluid through a segment of the small intestine of the dog is identical in principle to the Stewart-Hamilton technique for measuring cardiac output. The use of a Foley's catheter ensures the required efficiency of collecting samples at the collecting site. The flow rates calculated from the dye dilution curves correlated closely with rates determined independently by the ratio of polyethylene glycol concentration in the infused solution to that in the pooled sample obtained from the jejunal cannula. The technique is only applicable to steady-state conditions, and for this reason a steady perfusion of the small intestine had to be created by constant infusion of an isotonic electrolyte solution, resulting in satisfactory measurements. In an application of the method, metoclopramide caused a significant decrease in the mean transit time and volume of the perfused segment in comparison with saline in dogs (the mean flow rates were not significantly affected). The dye (bromsulphthalein) dilution curve after the injection of metoclopramide reached an earlier and higher peak than when saline was injected but the areas were almost exactly equal, confirming the similarity of flow rates at the collection site.

3108 THE PHYSIOPATHOLOGICAL FEATURES OF DUODENAL DIGESTION AND ABSORPTION. *(It.)* Barbara, L. (1st Dept. Spec. Med. Path., Clin. Methodol., U. Bologna, Italy) and G. Fontana. *Minerva Gastroent* 15(3):140-167, 1969.

3109 THE INFLUENCE OF BLOOD FLOW ON WATER AND SOLUTE ABSORPTION IN THE JEJUNUM OF THE RAT. *(Ger.)* Winne, D. (Pharm. Inst. U. Tubingen, Germany). *Naunyn Schmiedeberg Arch Pharmakol* 265(5): 425-444, 1970.

3110 IRON EXCRETION INTO GASTRIC JUICE. *(E.)* Kimura, I. (Okayama U. Med. Sch., Japan). *Jap J Nucl Med* 6(4):413, 1969.

3111 INTESTINAL ABSORPTION OF CALCIUM IN FASTING PATIENTS. *(E.)* Fromm, G. A. (Surg. Inst., Prov. Buenos Aires, Haedo, Argentina), J. Litvak and O. J. Degrossi. *Lancet* 1(7647):616-617, 1970.

3112 ABSORPTION OF HEMOGLOBIN IRON: THE ROLE OF XANTHINE OXIDASE IN THE INTESTINAL HEME-SPLITTING REACTION. *(E.)* Dawson, R. B. (Tufts U. Sch. Med., Boston, Mass.), S. Rafal and L. R. Weintaub. *Blood* 35(1):94-103, 1970.

3113 THE ABSORPTION, DISTRIBUTION, AND EXCRETION OF PENTAZOCINE IN MAN AFTER ORAL AND INTRAVENOUS ADMINISTRATION. *(E.)* Beckett, A. H. (Dept. Pharm., Chelsea Coll., London, England), J. F. Taylor and P. Kourounakis. *J Pharm Pharmacol* 22(2):123-128, 1970.

3114 EFFECT OF RECTAL LUMEN CONCENTRATION ON THE REABSORPTION OF IONS AND WATER BY THE AMERICAN COCKROACH. *(E.)* Sauer, J. R. (Dept. Entomol., Oklahoma St. U., Stillwater), J. J. Levy, D. W. Smith and R. R. Mills. *Comp Biochem Physiol* 32(4):601-614, 1970.

3115 HEMOGLOBIN UPTAKE BY RAT HEPATOCYTES AND ITS BREAKDOWN WITHIN LYSOSOMES. *(E.)* Goldfischer, S. (Albert Einstein Coll. Med., Yeshiva U., Bronx, N. Y.), A. B. Novikoff, A. Albala and L. Biempica. *J Cell Biol* 44(3):513-529, 1970.

3116 THE CHEMICAL BOND OF COBALT, ITS ABSORPTION IN THE GASTROINTESTINAL TRACT AND ITS INCORPORATION INTO PROTEIN METAL LIVER COMPLEXES. *(Rus.)* Merkulova, I. S. (Gorki Med. Inst., Donetsk, USSR), V. R. Soroka and N. Z. Rudenko. *Vop Pitan* 28(6):48-51, 1969.

3117 WATER AND SOLUTE UPTAKE BY RECTAL PADS OF *PERIPLANETA AMERICANA*. *(E.)* Wall, B. J. (Dept. Biol., Case Western Reserve U., Cleveland, Ohio) and J. L. Oschman. *Amer J Physiol* 218(4):1208-1215, 1970.

3118 TRANSPORT ACROSS CELL MEMBRANES. *(E.)* Whittam, R. (Dept. Physiol., U. Leicester, England) and K. P. Wheeler. *Ann Rev Physiol* 32:21-60, 1970.

3119 ALCOHOL-INDUCED HYPOGLYCEMIA IN CHILDHOOD. *(E.)* MacLaren, N. K. (Queen Elizabeth Hosp. Child., London, England), H. B. Valman and B. Levin. *Brit Med J* 1(5691):278-280, 1970.

3120 INHIBITION OF SORBITOL OXIDATION BY ETHANOL IN INTACT RATS PRETREATED WITH TRIIODOTHYRONINE OR PROPYL THIOURACIL. *(E.)* Hillbom, M. E. (Res. Lab., Alko, Helsinki, Finland). *Biochem Pharmacol* 19(2):483-486, 1970.

3121 FACTORS AFFECTING GASTROINTESTINAL ABSORPTION OF DRUGS. *(E.)* Levine, R. R. (Boston U. Med. Ctr., Mass.). *Amer J Dig Dis* 15(2):171-188, 1970.

3122 PHARMACOLINETIC ASPECTS OF BILIARY EXCRETION: DOSE DEPENDENCY OF RIBOFLAVIN IN THE RAT. *(E.)* Nogami, H. (Fac. Pharm. Sci., U. Tokyo, Japan), M. Hanano, S. Awazu and T. Iga. *Chem Pharm Bull* 18(2):228-234, 1970.

- P:Motil (3132)
- P:Secr:Hepatobil (3163) (3165) (3202)
- P:Secr:Int (3233)
- P:Gen (3244) (3245)
- D:Stomduo (3367)
- D:Stomduo:Peptulc (3410)
- D:S.Intest:Malabs (3438) (3439) (3449) (3458)
- D:Livbil (3545)
- D:Livbil:Gallb (3664)
- D:Gen (3698) (3744) (3754)
- D:Gen:Parasit (3787)

MOTILITY

3123 PHARMACOLOGIC IDENTIFICATION OF THE LOWER ESOPHAGEAL SPHINCTER. *(E.)* Christensen, J. (U. Iowa Coll. Med., Iowa City). *J Clin Invest* 49(4):681-691, 1970.

Both upper and lower (the most distal 1 to 2 cm) esophageal sphincters were demonstrated manometrically in 10 adult male and female opossums. A variety of agonists were used to seek differences between circular muscle from the sphincteric segment and more rostral levels, recording *in vitro* the isometric contractions of strips from the distal 6 cm. Significant differences in threshold concentration occurred for acetylcholine (4 animals), carbachol (3), methacholine (3), nicotine (3), DMPP (1, 1-dimethyl-4-phenylpiperazinium iodide) (3), norepinephrine (4), norepinephrine with propranolol (4); the more distal strips being more sensitive. The gradient of threshold was much steeper for norepinephrine than for the other drugs. Maximal responses did not differ among levels for the choline esters or ganglionic stimulants, but showed proximal diminution for norepinephrine. Responses among the 6 levels of the esophagus were identical (or showed only small differences) when using barium (3 animals), atropine (3), and potassium (3). The sphincter is defined, at least in part, in the esophageal wall rather than in the central nervous system. The greater magnitude of the difference in sensitivity to norepinephrine than for the other agents suggests that the adrenergic innervation is important in defining the lower esophageal sphincter.

3124 ACTION OF CAERULEIN ON THE BILIARY SYSTEM OF THE DOG. *(E.)* Bertaccini, G. (Inst. Pharmacol., U. Parma, Italy), G. Ballarini, A. Agosti and G. Zannetti. *Arch Int Pharmacodyn* 183(2):261-269, 1970.

The decapeptide caerulein was tested in the dog for activity on the biliary system with a radiographic technique using ioglycamic acid as a contrast medium. The threshold doses of caerulein for cholecystokinetic activity by i.v. and s.c. routes were 0.001 and 0.01 μg/kg resp and spasmogenic effects on the gallbladder with high doses (1 μg/kg) lasted up to 6 to 7 hr. The effect of caerulein on the intra- and extrahepatic bile ducts was documented by the roentgenographic disappearance of these ducts and the spasmogenic activity of caerulein appeared to spare the intraduodenal portion of the choledochus. The observed action of caerulein resembles that of the endogenous hormone cholecystokinin-pancreozymin.

3125 ELECTROMYOGRAPHIC STUDY OF NORMAL HUMAN GASTRIC MOTOR ACTIVITY. *(Fr.)* Monges, H. (North Hosp., Marseilles, France) and J. Salducci. *Arch Franc Mal Appar Dig* 59(1-2):29-38, 1970.

3126 THE pH DEPENDENCE OF HISTAMINE ACTION ON THE GUINEA PIG ILEUM. *(E.)* Gero, A. (Hahnemann Med. Coll. Hosp., Philadelphia, Pa.) and M. T. Daniele. *Arch Int Pharmacodyn* 183(2):315-319, 1970.

3127 GASTRIC PERISTALSIS: A STUDY OF REGIONAL RATES OF CONTRACTION. *(E.)* Beck, C. S. (Stanford U. Sch. Med., Palo Alto, Calif.) and G. R. Mason. *Amer J Surg* 119(2):217-219, 1970.

3128 PHYSICAL FACTORS IN THE STIMULATION OF COLONIC PERISTALSIS. *(E.)* Hardcastle, J. D. (St. Mark Hosp., London, England) and C. V. Mann. *Gut* 11(1):41-46, 1970.

3129 THE EFFECT OF THE INTRINSIC MUCOSAL REFLEX UPON THE PROPAGATION OF INTESTINAL CONTRACTIONS. *(E.)* Hukahara, T. (Okayama U. Med. Sch., Japan), T. Neya and K. Tsuchiya. *Jap J Physiol* 19(6):824-833, 1969.

3130 THE MOTILITY OF THE GASTRO-INTESTINAL TRACT. *(E.)* Demling, L. (Med. Clin. Polyclin., U. Erlangen-Nuremberg, Germany). *Digestion* 2(6):362-368, 1969.

3131 CHOLINERGIC AND HISTAMINERGIC ACTION ON THE GUINEA-PIG ILEUM. *(E.)* Gero, A. (Hahnemann Med. Coll., Philadelphia, Pa.) and S. Gurland. *Arch Int Pharmacodyn Ther* 183(1):25-27, 1970.

3132 MECHANISMS IN INTESTINAL TRANSFER. *(E.)* Smyth, D. H. (Dept. Physiol., U. Sheffield, England). *J Clin Path* 23(1):1-6, 1970.

- P:Morph (3073)
- P:Secr:Int (3232) (3238)
- P:Gen (3258)
- P:Esoph (3313) (3317)
- D:Stomduo (3370) (3385)
- D:L.Intest (3459)
- D:Livbil:Gallb (3687) (3694)
- D:Gen (3701) (3744)
- D:Gen:Parasit (3786)

SECRETION AND METABOLISM

Stomach

3133 THE RESPONSE OF THE ISOLATED RAT STOMACH TO ETHANOL. *(Fr.)* De Saint-Blanquat, G. (I. N. S. E. R. M., Toulouse, France), D. Gaillard and R. Derache. *J Physiol Paris* 61(5):435-442, 1969.

The gastric secretory response to 1 or 10% solutions of ethanol, histamine or gastrin was studied in the isolated rat stomach. Free acid secretion (but not total acid) was stimulated by 1% solutions of ethanol, histamine and gastrin while pepsin secretion was stimulated by 1% solutions of ethanol or gastrin and inhibited by 1% solution of histamine. Acid secretion was inhibited and pepsin and lactic acid secretion was stimulated by 10% ethanol. Gastric hyperactivity produced by low concentrations of ethanol seemingly may be due to gastrin stimulation.

3134 STUDIES ON THE EFFECT OF 2-PHENYL-2-(2-PYRIDYL)-THIOACETAMIDE (ANTIGASTRIN) ON CANINE GASTRIC ACID SECRETION. *(E.)* Eisenberg, M. M. (Dept. Surg. U. Minnesota, Minneapolis), J. Isaza, K. Sugawara and R. Tiongco. *Surgery* 67(3):462-467, 1970.

Effects of 2-phenyl-2-(2-pyridyl)-thioacetamide (antigastrin) on gastric acid secretion was studied in 4 dogs with Heidenhain pouches and isolated innervated antrums and 5 dogs with Heidenhain pouches and gastric fistulas. Antigastrin significantly inhibited fundic pouch gastrin secretion with maximal inhibition ranging from 45.2 ± 11% with 10 mg dose to 93.9 ± 1.9% for 160 mg dose of antigastrin. Duration of maximum inhibition was less than 60 min with 10 and 20 mg; 40 mg or greater caused sustained inhibition for 120 to 180 min. In gastric fistula dogs, antigastrin was less effective in inhibiting gastric secretion stimulated by 2-deoxy-D-glucose and histamine; 80 mg of antigastrin significantly inhibited response to 2-deoxy-D-glucose by 40% while 160 mg produced retching. In gastric fistula and denervated fundic pouch dogs, histamine-induced gastric acid secretion was inhibited by antigastrin (40 mg) by 43% and 46% resp. The precise role and specificity of antigastrin in inhibition of nervous- or histamine-stimulated gastric secretion is unclear; interference with histamine- and vagally stimulated gastric juice may seemingly represent inhibition of potentiating background gastrin.

3135 INHIBITORY ACTION OF CHOLECYSTOKININ-PANCREOZYMIN ON GASTRIC PEPTIC SECRETION. *(E.)* Nakajima, S. (U. Alabama Med. Ctr., Birmingham) and D. F. Magee. *Experientia* 26(2):159, 1970.

The effect of cholecystokinin-pancreozymin on pepsin secretion stimulated by the cholinomimetic agent acetyl-β-methylcholine (mecholyl) was studied in six adult mongrel dogs, each with a vagally denervated Heidenhain pouch. Cholecystokinin-pancreozymin (1.0 Ivy dog unit per min i.v.) produced a significant inhibition of gastric pepsin secretion stimulated by mecholyl (2 μg/min). Pepsin inhibition was prompt and was 41% complete within 10 min of the start of cholecystokinin-pancreozymin administration, and 85% complete after 60 min. Pepsin secretion was reduced by cholecystokinin-pancreozymin from a mecholyl-stimulated high value of about 100 mg tyrosine per 10 min to a resting value of nearly 25 mg tyrosine per 10 min. Cholecystokinin-pancreozymin significantly inhibits the acid response to gastrin extract, to synthetic peptidase and to endogenously released gastrin and seemingly may be enterogastrone.

3136 FACTORS WHICH DETERMINE THE GASTRIC SECRETORY RESPONSE TO 2-DEOXY-D-GLUCOSE. *(E.)* Himsworth, R. L. (Coll. Physicians Surg., Columbia U., New York, N.Y.) and D. G. Colin-Jones. *Gut* 10(12):1015-1019, 1969.

The minimum amount of 2-deoxy-D-glucose given as a single rapid i.v. injection which would invariably cause a sustained secretion of gastric acid in normoglycemic rats was 25 mg, with the delay in onset (3 to 30 min) being significantly correlated to plasma glucose (delay was longest when the plasma glucose concentration was highest). If the initial plasma glucose concentration was greater than 200 mg/100 ml, this dose of 2-deoxy-D-glucose did not cause an increase in gastric acid output. An established secretion of gastric acid resulting from the administration of 2-deoxy-D-glucose could always be ended by the i.v. infusion of high levels of glucose. A preliminary dose of 90 mg of 3-0-methylglucose prevents the gastric secretory response that should follow injection of 25 mg of 2-deoxy-D-glucose; however, a further dose of 3-0-methylglucose is followed by the typical increase in gastric acid output. Since both glucose and 3-0-methylglucose can prevent 2-deoxy-D-glucose from exciting the gastric secretory center in the brain it appears that the same transport system is used. The use of 2-deoxy-D-glucose for purposes of investigation in man is hazardous because the characteristics of the blood-brain barrier are such that the cells of the brain become progressively more accessible to 2-deoxy-D-glucose as the plasma glucose concentration falls below normal, and the effects of 2-deoxy-D-glucose can be reversed only slowly.

3137 EFFECT OF COMBINATION OF HISTAMINE AND PENTAGASTRIN ON GASTRIC SECRETION IN MAN AND DOG. *(E.)* Grossman, M. I. (VA Ctr., Los Angeles, Cal.), A. M. Brooks and L. R. Johnson. *Gastroenterology* 58(4):470-475, 1970.

Gastric secretion in response to i.v. infusions of histamine and pentagastrin, alone and in combination, was studied in 4 men and in dogs. In man, mean acid outputs stimulated by combinations of histamine and pentagastrin, in doses (0.04 mg/kg/hr and 6.0 μg/kg/hr, resp.) that produced maximal responses when given alone, were not significantly higher than the maximal observed response to either agent alone and clearly were below the calculated maximal response to histamine. This combination of stimulants did not potentiate pepsin secretion either. In dogs with gastric fistulas, equivalent combinations of histamine and pentagastrin potentiated gastric acid secretion.

3138 THE ISOLATION OF GLYCOPROTEIN FROM GASTRIC SECRETION. *(Ger.)* Kuhn, D. (Med. U. Polyclin. Heidelberg, Germany) and H. Weicker. *Z Klin Chem Klin Biochem* 8(1):80-84, 1970.

3139 STUDY OF URINARY PEPSINOGEN AND ITS CORRELATION WITH GASTRIC PROTEOLYTIC ENZYME SECRETION. *(Fr.)* Hirsch-Marie, H. (Hosp. St. Antoine, Paris, France) and M. Conte. *Rev Franc Etud Clin Biol* 14(10):977-983, 1969.

3140 QUANTITATIVE MEASUREMENT OF GASTRIC AND URINARY PEPSINOGEN AND PEPSIN BY LAURELL'S ELECTROPHORETIC IMMUNO-PRECIPITATION. *(Fr.)* Hirsch-Marie, H. (Hosp. Saint Antoine, Paris, France) and M. Conte. *Arch Franc Mal Appar Dig* 59(1-2):63-70, 1970.

3141 THE EFFECTS OF ABOMINE, ACIDINE-PEPSIN AND ACIDINE-MUCOSINE ON THE GASTRIC SECRETION IN DOGS. *(Rus.)* Chemodanova, D. I. (Dept. Zool., Gorki Pedagog. Inst., Omsk, USSR) *Farmakol Toksik* 32(6):696, 1969.

3142 SOME POLYPEPTIDES INFLUENCING GASTRIC-ACID SECRETION. *(E.)* Gregory, H. (Imperial Chem. Indust., Alderley Park, Macclesfield, England). *Amer J Dig Dis* 15(2):141-148, 1970.

3143 THE SECRETORY PATTERN OF THREE STOMACH PREPARATIONS IN THE RAT. *(E.)* Svensson, S. E. (Inst. Physiol., U. Lund, Sweden). *J Physiol* 207(2):329-350, 1970.

3144 THE RELATIONSHIP BETWEEN GASTRIC SECRETION, ELECTROLYTES AND ACID-BASE BALANCE. *(It.)* Maselli-Campagna, G. (Gen. Clin. Surg. Clin. Therap., U. Bari, Italy), R. Sorace, S. Ferrarese, V. Ronzini and V. Disanto. *Chir Gastroent* 3(3):283-303, 1969.

3145 PROTECTION OF THE GASTRIC MUCOSA BY POLYGALACTOSULPHATE IN EXPERIMENTAL AGRESSION CONDITIONS. *(Fr.)* Wegmann, R. (Inst. Med. Histochem., Paris, France) and J. Thomas. *Ann Histochim* 14(3):287-297, 1969.

3146 HISTAMINE, HISTIDINE DECARBOXYLASE AND GASTRIN IN THE UPPER GASTROINTESTINAL TRACT OF CHICKENS. *(Ger.)* Ruoff, H. J. (Pharmacol. Inst., U. Tubingen, Germany) and K. F. Sewing. *Naunyn Schmiedeberg Arch Pharmakol* 265(4):301-309, 1970.

3147 STIMULATION OF GASTRIC SECRETION IN TOTAL EXTERNAL PANCREATIC FISTULA. *(Sp.)* Cipitria, J. C. (Hosp. Ramon Mejia, Buenos Aires, Argentina), G. F. Cualli, C. A. Linares and C. J. Morel. *Rev Argent Cir* 16(5):469-472, 1969.

3148 EFFECTS OF CINCOPHEN ON GASTRIC MUCOSA SECRETION IN ANTRAL POUCH DOGS. *(Jap.)* Nakamura, S. (Gunma U. Sch. Med., Maebashi, Japan). *Kitakanto Med J* 19(2):105-111, 1969.

3149 GASTRIC SECRETION AFTER PENTAGASTRIN AND HISTAMINE IN THE BASAL SECRETING FERRET. *(E.)* Basso, N. (2nd Surg. Clin. Polyclin. Umberto I, Rome, Italy), J. L. A. Roth and C. J. Pfeiffer. *J Surg Res* 10(3):111-115, 1970.

3150 AN IMMUNOLOGICAL ASSAY FOR THE INTRINSIC FACTOR ACTIVITY IN HOG GASTRIC MUCOSAL EXTRACT. *(Fr.)* Wolff, R. (Fac. Med., Nancy, France), J. P. Nicolas and C. Tamisier. *Ann Biol Clin* 27(10-12):707-713, 1969.

3151 GASTRIN DERIVATIVES INVESTIGATED FOR SECRETORY POTENCY AND FOR CHANGES IN GASTRIC MUCOSAL HISTAMINE FORMATION. *(E.)* Rosengren, E. (Inst. Physiol. U. Lund, Sweden) and S. E. Svensson. *Brit J Pharmacol* 38(3):473-477, 1970.

- P:Morph (3027) (3033) (3037) (3061) (3073) (3085)
- P:Absorp (3098) (3104) (3110)
- P:Motil (3125)
- P:Gen (3241)
- Diagproc (3266) (3281) (3287) (3293)
- D:Stomduo (3342) (3345) (3353) (3354) (3355) (3361) (3362) (3363) (3367) (3368) (3383)
- D:Stomduo:Peptulc (3389) (3403) (3409)
- D:Gen (3705)

SECRETION AND METABOLISM

Pancreas

3152 RELATIONSHIP BETWEEN PANCREATIC SECRETION AND PANCREATIC BLOOD FLOW. *(E.)* Goodhead, B. (U. Texas Med. Sch., San Antonio), H. S. Himal and J. Zanbilowicz. *Gut* 11(1):62-68, 1970.

Pancreatic secretion volume (ml/min), pancreatic blood flow (ml/min), cardiac output (ml/min/kg) and pancreatic perfusion rate (ml/min/100g) were measured in control dogs and dogs infused with secretin, pancreozymin, urecholine or pentagastrin. The values for secretion volume, blood flow, cardiac output and perfusion rate were 0.012, 15.6, 182 and 57, resp., in control dogs and 0.465, 45.8, 240 and 164.2, resp., in response to secretin infusion. Secretion volume, blood flow and perfusion rate were increased by infusion of pancreozymin, urecholine and pentagastrin but to a lesser extent than the increase produced by infusion of secretin. Secretin also increased total blood and perfusion rate to esophagus, stomach, duodenum, gallbladder, pancreas, jejunum, ileum and colon.

3153 A FURTHER PHYSIOLOGICAL ROLE FOR NATURALLY OCCURRING TRYPSIN INHIBITORS: THE EVIDENCE FOR A TROPHIC STIMULANT OF THE PANCREATIC ACINAR CELL. *(E.)* Melmed, R. N. (Middlesex Hosp. Med. Sch., London, England) and I. A. D. Bouchier. *Gut* 10(12): 973-979, 1969.

The pancreas of male Sprague-Dawley rats fed a raw soybean supplement (with its naturally occurring heat-labile trypsin inhibitor) was 20 to 40% larger than the pancreas of a control group fed a heated soybean-supplemented diet. Both the specific activity and content of amylase were markedly increased in the pancreas of rats fed a daily supplement of purified trypsin inhibitor from soybean (0.6% w/w), ovomucoid (0.6% w/w) and bovine pancreas (0.043% w/w). Right or left vagotomy did not influence the response of the pancreas to raw soybean-supplemented diet and purified trypsin inhibitor. The primary function of the endogenously secreted pancreatic trypsin inhibitor may be to potentiate enzyme synthesis by the acinar cell thus providing an important stimulus for the repletion of digestive enzymes.

3154 EFFECT OF PRESSURE ON THE INTEGRITY OF THE DUCT-ACINAR SYSTEM OF THE PANCREAS. *(E.)* Pirola, R. C. (Roy. Free Hosp., London, England) and A. E. Davis. *Gut* 11(1):69-73, 1970.

Tests using India ink introduced into the pancreatic ducts of adult cats show that even in a 15-min period the duct contents can largely escape into the interstitial tissues at pressures below the maximum secretory pressure of the pancreas. There was a close correlation between the pressure in the pancreatic duct and the amount of ink seen in the interstitial tissues, and the escape of ink (which appears to leave through clefts between the acinar cells) was only obvious at pressures of 30 and 40 mm Hg. Stimulated secretory pressure rose from 12 to 15 mm Hg during the control period to peaks of about 47 mm Hg within 10 min. Apart from pressure, other factors such as pancreatitis and the nature of the duct contents, can affect the integrity of the duct-acinar system.

3155 THE GASTROINTESTINAL STUMULUS TO INSULIN RELEASE: II. A DUAL ACTION OF SECRETIN.

(E.) Kraegen, E. W. (St. Vincent's Hosp., Darlinghurst, New South Wales, Australia), D. J. Chisolm, J. D. Young and L. Lazarus. *J Clin Invest* 49(3): 524-529, 1970.

To further study the role of secretin in insulin release in normal subjects, 2 consecutive 20 min i.v. glucose infusions were administered to 9 healthy male volunteers (aged 18-23 yr) 150 min apart with and without intervening secretin infusion (10 U) given to approximate serum secretin levels seen after oral glucose ingestion. A highly significant potentiation of the insulin response to the postsecretin glucose infusion occurred when secretin was given 7 or 25 min before glucose (in the latter case, serum secretin was undetectable during the glucose infusion). Despite the augmented insulin response, no consistent change in blood glucose variation was observed and this is consistent with the suggestion that the facilitated disposal of an alimentary glucose load is not dependent solely on enhanced insulin secretion.

3156 INFLUENCE OF GLUCAGON ON PANCREATIC EXOCRINE SECRETION IN MAN.

(E.) Dyck, W. P. (Scott and White Clin., Temple, Texas), E. C. Texter, Jr., J. M. Lasater and N. C. Hightower, Jr. *Gastroenterology* 58(4):532-529, 1970.

The effects of i.v. injection of glucagon (1.0, 5.0, and 10.0 µg/kg) on pancreatic exocrine function were studied in 7 healthy human subjects during continuous i.v. infusion of secretin (3 U/kg/hr) and pancreozymin (1 U/kg/hr). Glucagon significantly depressed pancreatic secretory flow (without an accompanying reduction in bicarbonate levels) and total protein concentration in all subjects, as maximal inhibition of hormonally stimulated volume and protein concentration always occurred within the first 5 to 10 min and the inhibitory effect lasted no longer than 5 to 20 min for volume and 10 to 30 min for protein concentration. Changes in blood glucose concentration before and after glucagon administration did not follow a consistent pattern and bore no apparent relation to changes in pancreatic secretory volume. Glucagon may have a regulatory role in the control of pancreatic secretion.

3157 VAGAL STIMULATION: II. ITS EFFECT ON PANCREATIC SECRETION IN CONSCIOUS DOGS.

(E.) White, T. T. (U. Washington Sch. Med., Seattle), J. Bourda, L. A. Robinson and Y. Suda. *Ann Surg* 171(3):357-364, 1970.

3158 EFFECT OF LONG-TERM ADMINISTRATION OF SECRETORY SUPPRESSIVES ON RAT PANCREAS.

(E.) Lee, Y. S. (Yonsei U. Coll. Med., Seoul, Korea), Y. B. Lee and S. S. Hong. *Yonsei Med J* 10(1):19-24, 1969.

- P:Morph (3038) (3054) (3080) (3090) (3092)
- P:Secr:Int (3232)
- Diagproc (3266) (3289)
- D:Pancreas (3520) (3525)
- D:Pancreas;Pancreat (3534) (3535) (3536)

SECRETION AND METABOLISM

Hepatobiliary Tract

3159 THE TOXIC EFFECTS OF DIETHYL ETHER ON LIVER NUCLEIC ACID METABOLISM.

(E.) Green, C. D. (U. Virginia Sch. Med., Charlottesville) and W. B. Looney. *Progress in Anesthesiology: Proceedings of the Fourth World Congress of Anesthesiologists* 910-912, 1968.

The effects of diethyl ether anesthesia on nucleic acid metabolism were studied in regenerating, posthemihepatectomized rat liver. The relative rate of DNA synthesis in regenerating liver cells was determined by the grain count per cell nucleus in autoradiographs. The grain count per nucleus after exposure to 60 sec and 60 min of diethyl ether anesthesia was 55.3 ± 5.6 and 38.5 ± 3.4, resp. Administration of ^{14}C-orotic acid immediately after diethyl ether anesthesia revealed a grain count/min/mg DNA of 11,190 ± 1618 after 2 min of anesthesia and 13,882 ± 1682 after 30 min. Diethyl ether anesthesia slows the rate of DNA formation.

3160 METABOLISM OF ETHANOL AND FRUCTOSE IN THE PERFUSED RAT LIVER. *(E.)* Papenberg, J. (Med. Chem. Inst. U. Berne, Switzerland), J. P. von Wartburg and H. Aebi. *Enzym Biol Clin* 11(3): 237-250, 1970.

The interrelations between ethanol, glucose and fructose metabolism by isolated perfused rat liver were studied by determining the changes in enzyme (alcohol dehydrogenase and catalase) and metabolite (lactate, pyruvate) patterns. The initial concentration (200 mg/100 ml) of ethanol added to the perfusate decreased linearly (62 mg oxidized in the first hr and 52 mg in the second hr) indicating that ethanol utilization by the liver is independent of ethanol concentration. Addition of pyrazol (3×10^{-3}M) to the perfusate resulted in a 90% decrease in alcohol dehydrogenase activity and a parallel decrease in ethanol utilization (ethanol oxidation was decreased by 62% in the first hr). Ethanol inhibited the uptake of fructose and its conversion to glucose by perfused liver. Ethanol oxidation was decreased by 25% in the presence of added fructose and fructose uptake was decreased by 21% in the presence of added ethanol. Increased ratios of lactate to pyruvate and α-glycerophosphate to dihydroxyacetone phosphate occurred during ethanol oxidation by isolated perfused liver (these changes were not prevented by pyrazol-induced inhibition of alcohol dehydrogenase).

3161 THE EFFECT OF HEPARIN ON THE METABOLISM OF TRIGLYCERIDES BY THE LIVER. *(E.)* Heimberg, M. (Vanderbilt U. Sch. Med., Nashville, Tenn.) and D. C. Davis. *Biochem Pharmacol* 19(2): 411-420, 1970.

The effects of heparin on the output of triglycerides, the uptake of chylomicra, the release of lipolytic activity into the perfusate, and the production of glucose, urea and ketone bodies were studied in the isolated, perfused rat liver. The output of triglycerides by the liver was significantly inhibited by crystalline heparin only at the smallest concentrations (0.42 USP units/ml perfusate) and the release of lipolytic activity by the liver was stimulated as the concentration of heparin in the medium increased (the maximal effect occurred at a concentration of 42 USP units/ml perfusate). Paradoxically, as the lipolytic activity in the medium increased, the inhibition of output of triglycerides by heparin diminished. The output of ketone bodies was slightly decreased by heparin but output of glucose and urea were not affected. The uptake and utilization by the liver of chylomicra labeled with palmitic acid -1-^{14}C was accelerated by crystalline heparin. The output of triglyceride into very low density lipoprotein by the liver and the uptake of either chylomicron or very low density lipoprotein triglyceride seemingly occur by different cellular mechanisms.

3162 EFFECT OF L-ASPARAGINASE ON DNA SYNTHESIS IN REGENERATING LIVER AND IN OTHER DIVIDING TISSUES. *(E.)* Becker, F. F. (New York U. Sch. Med., New York), R. Baserga and J. D. Broome. *Cancer Res* 30(1):133-137, 1970.

The effect a single subtumoricidal dose (600 units i.v. or i.p.) of L-asparaginase on DNA synthesis (as measured by tritiated thymidine incorporation) was studied in residual rat hepatocytes following 70% hepatectomy, in continuously dividing rat cells (lining epithelium of the jejunal and ileal crypts, white and red pulp of the spleen and basal layer of the epidermis), and in quiescent mouse and rat parotid and kidney cells stimulated (isoproterenol, folic acid and unilateral nephrectomy) to divide. DNA synthesis in regenerating hepatocytes but not that in continuously dividing cells or cells stimulated to divide was inhibited by L-asparaginase for 10 hr. Regenerating hepatocytes recovered from the inhibitory effect of L-asparaginase 10 to 12 hr after hepatectomy and were resistant to its inhibitory effect if L-asparaginase was administered at that time. Some early phase of biochemical response to 70% hepatectomy may be dependent upon an exogenous source of asparagine, thus implying participation in this response of important, newly-synthesized proteins.

3163 ROLE OF LIVER-CELL POTASSIUM IONS IN SECRETION OF SERUM ALBUMIN AND LIPOPROTEINS. *(E.)* Judah, J. D. (U. Coll. Hosp. Med. Sch., London, England) and M. R. Nicholls. *Biochem J* 116(4):663-669, 1970.

The role of K$^+$ in liver cells on protein synthesis (as measured by incorporation of L-[1-^{14}C]leucine) and secretion of serum albumin and lipoprotein was studied *in vitro* in rat liver slices incubated in a medium with 7.7 mM K$^+$ or depleted of K$^+$. If slices were depleted of K$^+$, the incorporation of L-[1-^{14}C] leucine into slice proteins and the secretion of serum albumin was reduced and serum albumin accounted for 65% and lipoproteins about 5 to 10% of the labeled protein secreted by the slices. The effect of K$^+$ depletion in liver slices was reversed by the addition of K$^+$ to the medium; the amount of serum albumin secreted by slices varied linearly with the K$^+$ content of the slices; and Rb$^+$ (but not Cs$^+$, Li$^+$ and NH$_4^+$) could be substituted for K$^+$ in the medium. Addition of K$^+$ to the incubation medium promoted K$^+$ uptake and Na$^+$ and water efflux from liver slices and these effects were dependent on the K$^+$ concentration in the medium. The effect of K$^+$ on secretion of albumin and lipoprotein could be separated from its effect on protein synthesis by the addition of cycloheximide or puromycin to the incubation medium.

3164 THE EFFECT OF ORAL CONTRACEPTIVE STEROIDS ON BILE SECRETION AND BILIRUBIN *Tm* IN RATS. *(E.)* Heikel, T. A. J. (Dept. Chem. Path., U. Leeds, England) and G. H. Lathe. *Brit J Pharmacol* 38(3): 593-601, 1970.

The effects of estrogens, progestogens and their 17-α-ethinyl derivatives on bile flow, maximum rate of bilirubin secretion (*Tm*), and serum and liver bilirubin levels were studied in virgin female Wistar rats. Normal basal bile flow was 8.0 ± 2.1 mg/min

er 100 gm body weight, and during bilirubin in-
usion was 9.2 ± 2.4 mg/min per 100 gm body weight.
oth the 17-α-ethinyl substituted estrogens and
rogestogens greatly reduced basal bile flow and bile
low during continuous bilirubin infusion by 30 to
5% while the parent compounds, estradiol-17β and
9-nortesterone had little or no effect on bile
low. A large dose (40 mg/kg) of progestogens (ly-
estrenal and norethisterone acetate) reduced basal
ile flow to 6.3 ± 1.7 mg/min and bile flow during
ilirubin infusion to 6.0 ± 1.15 mg/min while 17-α-
thinylestradiol (25 mg/kg per day for 2 days) re-
uced basal bile flow to 5.3 ± 1.4 mg/min per 100 gm
ody weight from a control value of 9.0 ± 2.1 mg/min
nd bile flow during bilirubin infusion to 5.4 ±
.9 mg/min from a control value of 9.4 ± 1.8 mg/min.
ilirubin maximum secretion rate (*Tm*) was affected
y only the 3-methyl ether of 17-α-ethinylestradiol
mestranol) (a control value of 81.3 ± 6.9 μg/min
er 100 gm body weight was reduced to a value of
3.1 ± 8.3 μg/min).

3165 THE ROLE OF THE HEPATIC ENDOPLASMIC RETICULUM IN THE BILIARY EXCRETION OF FOREIGN COMPOUNDS BY THE RAT: THE EFFECT OF PHENOBARBITONE AND SKF 525-A (DIETHYLAMINOETHYL DIPHENYLPROPYLACETATE). *(E.)* Levine, W. G. (Albert Einstein Coll. Med., Yeshiva U., Bronx, N.Y.), P. Millburn, R. L. Smith and R. T. Williams. *Biochem Pharmacol* 19(1): 235-244, 1970.

The effect of phenobarbitone and SKF 525-A on the biliary excretion of several foreign compounds and the role of the endoplasmic reticulum in this process were studied in female albino Wistar rats. Phenobarbitone pertreatment of rats stimulated the biliary excretion of biphenyl, stilbestrol and phenolphthalein (all of which underwent metabolism prior to excretion in the bile) and did not affect the biliary elimination of stilbestrol glucuronide, phenolphthalein glucuronide, succinylsulphathiazole and indocyanine green (all of which were excreted unchanged). SKF 525-A which inhibited the glucuronide conjugation of stilbestrol and phenolphthalein depressed their excretion in the bile in the form of their O-glucuronides and did not influence the biliary excretion of phenolphthalein glucuronide. The biliary excretion of biphenyl, stilbestrol and phenolphthalein were considered to occur in at least 2 steps: 1) metabolism and 2) transfer of the metabolites to bile. Phenobarbitone and SKF 525-A treatment in rats influenced (1) but not (2). The endoplasmic reticulum seemingly is involved in the metabolism of foreign compounds but it does not appear to play a role in their transfer from liver to bile.

3166 EFFECTS OF CHRONIC ETHANOL FEEDING ON SERUM LIPOPROTEIN METABOLISM IN THE RAT. (*E.*) Baraona, E. (Mount Sinai Sch. Med., Bronx, New York) and C. S. Lieber. *J Clin Invest* 49(4):769-778, 1970.

In Sprague-Dawley rats, the chronic feeding of ethanol-containing diet (6 ml/100 g body weight) resulted in rapidly increasing levels of blood alcohol, reaching a peak 2 hr after gastric intubation (about 153 mg/100 ml blood), followed by a progressive decline. The incorporation of dietary palmitic acid-^{3}H and i.v. injected L-lysine-^{14}C into serum lipoproteins was increased. The main increases of total amount, labeling, and specific activity of lipid and protein occurred in the d<1.019 lipoprotein fraction. Fat absorption and the clearance of injected chylomicrons were not affected by ethanol feeding. Blocking of lipoprotein and chylomicron removal with Triton did not prevent the action of ethanol on serum lipids, indicating that the ethanol effect is not likely due to defective removal of lipids from the circulation. Ethanol enhanced the incorporation of chylomicron fatty acids into newly synthesized very low density lipoproteins, as shown by an increased reappearance of the fatty acid label into the lipids of this fraction after injection of palmitate-^{14}C/glycerol-^{3}H doubly labeled chylomicrons. Alcohol feeding resulted in a progressive accumulation of fat in the liver. The results indicate that alcoholic hyperlipemia is due, at least in part, to an increase in newly synthetized lipoproteins, and that it is unlikely that defective lipoprotein synthesis or secretion represent primary mechanisms for the pathogenesis of the alcoholic fatty liver.

3167 BIOCHEMICAL PATHOLOGY OF FATTY LIVER INDUCED BY INHALED CARBON TETRACHLORIDE, WITH SPECIAL REFERENCE TO ATP AND LIPID METABOLISM IN THE MOUSE LIVER. *(E.)* Watanabe, S. (Okayama U. Med. Sch., Japan). *Acta Med Okayama* 23(6): 559-567, 1969.

The contents of ATP, triglyceride and total lipid in liver and the P:O ratio of liver mitochondria were determined in mice exposed to inhalation of 800 p.p.m. of carbon tetrachloride for 8 hr and in control mice. Liver ATP content decreased slightly immediately after inhalation, rapidly decreased until 4 hr after inhalation and gradually decreased until 20 hr after inhalation. Total lipid content increased slightly immediately after the exposure to carbon tetrachloride and increased gradually until 20 hr later. Triglyceride content increased at an almost constant rate during and after exposure to carbon tetrachloride. P:O ratio of liver mitochondria did not change immediately after exposure but later kept parallel in relation to decreased ATP content in the liver as revealed by electron microscopy. The decrease in ATP content in the liver after carbon tetrachloride inhalation is attributed mainly to the uncoupling of oxidative phosphorylation of liver mitochondria.

3168 BILE COMPOSITION IN THE CANINE GALLBLADDER AFTER SELECTIVE GASTRIC AND TRUNCAL VAGOTOMY. *(E.)* Inberg, M. V. (Dept. Surg., U. Turku, Finland), J. Ahonen and T. M. Scheinin. *Ann Chir Gynaec Fenn* 58(4):329-333, 1969.

The composition (cholates, cholesterol and phospholipids) of gallbladder bile was studied successively after pyloroplasty, selective gastric vagotomy, and truncal vagotomy in four dogs. The composition of canine gallbladder bile was not significantly altered after selective gastric vagotomy, truncal vagotomy, and pyloroplasty alone, nor was the ratio of cholesterol to cholate. The only difference between selective gastric and truncal vagotomy was the increased resting volume and the great residual volume of the vagotomized gallbladder after its contraction. The association of gallstones with the vagotomized gallbladder is discussed.

3169 INHIBITION BY BILE SALTS OF THE JEJUNAL TRANSPORT OF 3-O-METHYL GLUCOSE. *(E.)*

Roy, C. C. (U. Colorado Med. Ctr., Denver), R. S. Dubois and F. Philippon. *Nature* 225(5237): 1055-1056, 1970.

The effects of bile salts on jejunal transport of 3-O-methyl glucose were studied in Sprague-Dawley rats with extracorporeally perfused segments of jejunum removed from their intact circulation. Bile depletion was carried out by use of bile duct fistula with cannula. There was a significant increase of 3-O-methyl glucose absorption in bile-depleted animals (23.2 ± 1.95 %/min vs controls 15.1 ± 1.13 %/min, $p < 0.01$). A marked difference in *in vitro* % absorption/min of 3-O-methylglucose existed between bile fistula rats perfused *in vivo* with electrolyte solution (33.6 ± 1.86 %/min) and those perfused with either bile (20.6 ± 1.04 %/min) or sodium taurocholate (21.8 ± 1.07 %/min) for 48 hr. There was no correlation between absorptive capacity and metabolic function as assessed by protein, hexokinase, Na^+/K^+-stimulated ATPase and glucose determinations performed on tissue immediately adjacent to removed jejunal segments. Since there was no apparent relationship between 3-O-methyl glucose absorption and metabolic function in presence or absence of bile salts, it is postulated that bile salts may have a specific effect on the monosaccharide-active transport system localized in plasma membrane of epithelial cell microvilli.

3170 BIOLOGICAL ASSAY OF CHOLECYSTOKININ IN GUINEA-PIG GALLBLADDER *IN SITU*. (*E.*)

Ljungberg, S. (Dept. Pharmacol. Stockholm, Sweden). *Acta Pharm Suec* 6(6):599-606, 1969.

A method for the biological assay of cholecystokinin in the guinea pig gallbladder *in situ* is described. Under urethane anesthesia the jugular vein was cannulated, the gallbladder was surgically exposed and a thin silk thread was fastened to its free pole, without perforation. In order to measure the isotonic contractions of the gallbladder, the bile duct was kept intact and the free end of the thread was extended over a pully, with a 0.5 gm counterweight, and connected to a strain transducer. An analysis of the effect of 5 different dosage levels of cholecystokinin (0.05 to 0.80 Ivy Dog Units/kg) revealed a rectilinear log dose-response line and the weighted mean of the precision index in ten assays was $\lambda = 0.0746 \pm 0.0087$.

3171 SOME PHARMACOLOGICAL PROPERTIES OF CHOLECYSTOKININ. (*E.*)

Ljungberg, S. (Dept. Pharmacol., Stockholm, Sweden). *Acta Pharm Suec* 6(6):607-612, 1969.

The pharmacologic properties of purified preparations of cholecystokinin-pancreozymin were investigated in mice, rabbits and guinea pigs. No toxic effects of a single i.v. administration of cholecystokinin (up to 2000 Ivy Dog Units (IDU)/kg) were produced in mice and doses between 0.2 and 32.0 IDU/kg, i.v., had no significant effect on the blood pressure, heart rate, and ventilation in urethane-anesthetized rabbits. A concentration of 0.005 IDU/ml caused an acetylcholine-like contraction in *in vitro* preparation of guinea pig intestine. Moderate doses of 1 IDU/kg gave a significant increase in lymph flow (1.23 ml/hr compared to a control value of 1.01 ml/hr) from the intestinal tract in rats. The cholecystokinin-pancreozymin preparation exhibited a villikinin-like activity characterized by stimulating movements of the villi and of intestinal activity.

3172 HEPATIC METABOLISM OF FREE FATTY ACIDS IN NORMAL AND DIABETIC DOGS. *(E.)*

Basso, L. V. (U. California San Francisco Med. Ctr.) and R. J. Havel. *J Clin Invest* 49(3):537-547, 1970.

Fasted dogs prepared with catheters in the femoral artery, portal vein, and hepatic vein and infused i.v. with palmitate $-1-^{14}C$ were used to estimate uptake of free fatty acids in liver and their conversion to major metabolic products secreted into hepatic venous blood. Animals were studied under normal conditions; when fat mobilization was increased abruptly by infusing norepinephrine; and when insulin was withdrawn from depancreatized dogs (it was assumed the 80% of hepatic blood flow was derived from the portal vein). Hepatic uptake was proportional to net outflow transport of plasma free fatty acids in the 3 groups and, in each, the hepatic extraction fraction was about 25%. Since the specific activity of the free fatty acids entering and leaving the liver was equal and their composition was closely similar in the 3 sites sampled, apparently palmitate is a representative tracer for free fatty acids entering the liver and the liver apparently does not release free fatty acids into the blood. In norepinephrine-infused dogs, the fraction of free fatty acids secreted in triglycerides (13%) was similar to that of control animals, so that transport of triglycerides was increased. In diabetic dogs no increased transport could be demonstrated since an average of only 2% of free fatty acids was converted to plasma triglyceride fatty acids; the hyperlipemia uniformly observed appeared to result from defective removal of triglycerides from the blood. A similar fraction of free fatty acids was converted to ketones in normal and norepinephrine-infused dogs, was somewhat higher in diabetic animals and, in addition, a substantial quantity of ketones was derived from unlabeled precursors. Fractional conversion of free fatty acids to CO_2 was similar in normal and norepinephrine-infused dogs, but reduced in the diabetics

3173 REDUCTION OF DEHYDROEPIANDROSTERONE SULFAT IN THE LIVER DURING ETHANOL METABOLISM.

(E.) Admirand, W. H. (U. California San Francisco Med. Ctr.), T. Cronholm and J. Sjovall. *Biochim Biophys Acta* 202(2):343-348, 1970.

ıe influence of the metabolism of ethanol on the re-
ıction of 17-ketosteroid sulfate to 17 β-hydroxy-
teroid sulfate *in vitro* was studied by gas-liquid
hromatography and mass spectrometry in liver slices
rom female guinea pigs. Superfusion of guinea pig
iver slices with a solution containing dihydroepian-
rosterone sulfate resulted in the formation of 5-
ndrosterone-3β,17β-diol sulfate and when ethanol
2.2-43.5 mM) was added to superfusion fluid there
as a consistent increase of 1.3-4.5 fold in andro-
tenediol sulfate production. The same magnitude of
ncrease occurred during superfusion with 1,1-dideu-
eroethanol, and there was a prompt incorporation of
euterium into the androstenediol sulfate to a maxi-
um of 42 atom percent excess (in the presence of 4-
romopyrazole, dideuteroethanol did not increase deu-
erated or nondeuterated androstenediol sulfate pro-
uction). The increased concentration of NADH dur-
ng ethanol metabolism apparently caused an increased
eduction of the 17-ketosteroid to the 17β-hydroxy-
teroid.

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- P:Absorp (3095) (3101) (3115) (3116) (3122)
- P:Motil (3124)
- P:Secr:Int (3230)
- P:Gen (3258)
- Diagproc (3260) (3266) (3301)
- D:S.Intest:Malabs (3451)
- D:Livbil (3550) (3558) (3563) (3564) (3565) (3573) (3574) (3577) (3578) (3579) (3580) (3587)
- D:Livbil:A.Nonv.Hep (3596) (3607) (3609) (3610) (3611) (3615) (3616) (3617) (3619) (3621)
- D:Livbil:C.Hep (3645)
- D:Livbil:Cirrh (3650) (3658)
- D:Livbil:Gallb (3661) (3670)
- D:Gen (3695)

Intestine

3226 VITAMIN D STIMULATION OF CALCIUM-DEPENDENT ADENOSINE TRIPHOSPHATASE IN CHICK INTESTINAL BRUSH BORDERS. *(E.)* Melancon, M. J. Jr. (Dept. Biochem., U. Wisconsin, Madison) and H. F. DeLuca. *Biochemistry* 9(8):1658-1664, 1970.

The activity of calcium-dependent ATPase in the brush borders of the small intestine was studied in vitamin D-deficient and -repleted (vitamin D_3, 400 or 500 IU p.o. or i.v.) chicks. ATPase activity in brush borders was increased 72 hr after vitamin D_3 administration. Addition of 10mM calcium ions to the incubation medium did not affect ATPase activity in isolated brush borders from vitamin D-deficient chicks but markedly increased ATPase activity in isolated brush borders from chicks which had received vitamin D_3. The stimulatory effect of calcium on brush border ATPase activity required the presence of Mg^{+2}; ATPase activity was markedly increased by Mg^{+2} but not to the extent of the combination of Mg^{+2} and Ca^{+2}. When Mg^{+2} was added to the incubation medium in concentrations lower than ATP concentration, ATPase activity in brush borders was markedly decreased. The activity of calcium-dependent ATPase in brush borders was optimal at pH 7.7 and was not affected by either Na^+/K^+ ATPase or oxidative phosphorylation both in the presence or absence of Ca^{+2}. The time course of the increase of calcium-dependent ATPase activity following p.o. or i.v. administration of vitamin D_3 was positively correlated with the time course of appearance of calcium absorption. Calcium-dependent ATPase activity in intestinal brush borders seemingly may be part of the vitamin D-induced calcium transport system.

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The cleaving of conjugated steroids by intestinal microflora was investigated by incubating cecal contents in germfree and conventional rats with conjugated steroids (7α-^{3}H-dehydroepiandrosterone 3-sulfate and 7α-^{3}H-dehydroepiandrosterone 3-glucuronoside) and identifying the products (Sephadex Chromatography). The steroid sulfate was completely hydrolyzed when incubated with an 800 x g sediment but not with the supernatant of cecal contents from conventional rats, and was not hydrolyzed when incubated with cecal contents or different fractions of intestinal mucosa from the germfree rats. The glucuronoside was completely hydrolyzed in all incubations. Ratios between free and conjugated metabolites (from chromatography of fecal extracts after 4-^{14}C-corticosterone administration) were 0.1 for females and 0.4 for males (in germfree rats), and 1.2 for females and 1.5 for males (in conventional rats). Glucuronidase seemingly is active even in germfree conditions; whereas, sulfatase activity seemingly is microbial and occurs both *in vitro* and *in vivo*.

3228 THE EFFECT OF PURE NATURAL SECRETIN ON THE BICARBONATE SECRETION INTO THE DUODENUM IN MAN. *(E.)* Petersen, H. (Ulleval Hosp., Oslo, Norway). *Scand J Gastroent* 5(2):105-111, 1970.

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7 EFFECTS OF ANOXIA AND METABOLIC INHIBITORS
ON THE SUGAR-EVOKED POTENTIAL AND DEMON-
RATION OF SUGAR-OUTFLOW POTENTIAL IN TOAD INTES-
NE. *(E.)* Hoshi, T. (Tohoku U. Sch. Med., Sendai,
pan) and Y. Komatsu. *Tohoku J Exp Med*
)(1):47-59, 1970.

38 THE EFFECT OF DUODENAL AND MID SMALL BOWEL
TRANSECTION ON THE FREQUENCY GRADIENT OF
E PACESETTER POTENTIAL IN THE CANINE SMALL INTES-
NE. *(E.)* Code, C. F. (Mayo Grad. Sch. Med., U.
nnesota, Rochester) and J. H. Szurszewski. *J
ysiol* 207(2):281-289, 1970.

3239 EFFECT OF VITAMIN D ON TISSUE CALCIUM OF RAT DUODENUM. *(E.)* Urban, E. (U. Iowa Coll. Med., Iowa City) and H. P. Schedl. *Scand J Gastroent* 5(1):33-37, 1970.

- P:Morph (3024) (3025) (3029) (3031) (3036) (3052) (3086) (3091) (3093)
- P:Absorp (3094) (3099) (3100) (3103) (3105) (3106) (3107) (3108) (3109) (3112)
- P:Motil (3126) (3131)
- P:Gen (3246) (3256) (3258)
- Diagproc (3311)
- D:S.Intest (3419)
- D:L.Intest (3500)
- D:Livbil:A.V.Hep (3636)
- D:Livbil:Gallb (3675)
- D:Gen (3719) (3736)

GENERAL

!0 EFFECT OF ETHANOL METABOLISM ON REDOX
STATE OF STEROID SULPHATES IN MAN. *(E.)*
onholm, T. (Karolinska Inst., Stockholm, Sweden)
d J. Sjovall. *Europ J Biochem* 13(1):124-131, 1970.

e concentrations of hydroxy- and ketosteroid sul-
ates in plasma and the incorporation of deuterium
the steroids were determined by gas chromatography
6 healthy men after the p.o. administration of
hanol (0.1-1g/kg). The ratios between the 17β-
droxysteroid and the 17-ketosteroid, between the 3-
lphates of 5α-androstane-3α, 17β-diol and andro-
erone and between their monosulphates increased
ter ethanol administration but the levels of 5α-
drostane-3β, 17β-diol monosulphate, pregnenolone
d 5-pregnene-3β, 20α-diol monosulphates could not
established. Oral administration (0.1g/kg) of
-$^2H_2$]ethanol resulted in rapid incorporation (16-22
om percent excess) into the sulphates of 17β-hy-
oxysteroids, slight incorporation (4 atom percent
cess) into the monosulphate of 5-pregnene-3β, 20α-
ol, and no incorporation into the disulphates. The
DH/NAD+ ratio in the liver cell cytoplasm seemingly
termines the ratio between 3-sulphates of 17β-hydro-
steroids and corresponding 17-ketosteroids in plasma
it the 3-sulphate of 5-pregnene-3β, 20α-diol is not
rmed at the same site or with the same coenzyme.

!41 GASTRIC MUCOSAL BLOOD FLOW FOLLOWING
DAMAGE BY ETHANOL, ACETIC ACID OR ASPIRIN.
.) Augur, N. A. Jr. (Dept. Physiol. U. Michigan,
n Arbor). *Gastroenterology* 58(3):311-320, 1970.

1e gastric mucosal blood flow in vagally denervated
idenhain pouches in dogs was estimated by aminopyrine clearance in four 30 min periods after irrigations with acid solutions of ethanol, acetic acid and aspirin. Mucosal blood flow increased initially when either ethanol or acetic acid was used and subsequently declined with appearance of evidence for gastric mucosal barrier damage. In spite of similar evidence for gastric mucosal barrier damage, the mucosal blood flow with the aspirin solutions was, by the fourth period, significantly greater than the mucosal blood flow with the acetic acid solutions. Studies with acetic acid and aspirin solutions were repeated in vagally innervated Pavlov pouches and the pattern of mucosal blood flow was similar and (in those experiments with homogeneous base lines) the mucosal blood flow of the aspirin studies in the fourth period was again significantly greater than that of the acetic acid study. Although a greater mucosal blood flow might be considered a beneficial and protective influence, invariable bleeding characterized the fourth period of the aspirin experiments while only inconstant and minimal bleeding was noted in the fourth period of the acetic acid experiments.

3242 TRANSPERITONEAL EXCHANGE: I. PERITONEAL PERMEABILITY STUDIED BY TRANSPERITONEAL PLASMA CLEARANCE OF UREA, PAH, INSULIN AND SERUM ALBUMIN IN RABBITS. *(E.)* Aune, S. (Ulleval Hosp., Oslo, Norway). *Scand J Gastroent* 5(2):85-97, 1970.

The blood-peritoneal barrier was studied by following the transfer of urea, p-aminohippuric acid, inulin and serum albumin (given in an i.v. infusion) from plasma into the peritoneal cavity (samples drawn through a drain inserted in the lateral part of the right iliac fossa) in rabbits. Relative clearance using urea clearance as a reference unit (transperitoneal clearance of test solute/transperitoneal clearance of urea) was not affected by variations throughout the experiment and indicated that p-aminohippuric acid appeared in the peritoneum at a rate of 50% of urea, inulin at a rate 25%, and serum albumin at a rate 4.5% (urea clearance itself averaged 2.75 ml/min). The relative clearance rates are comparable to relative diffusibilities. Solutes apparently pass through the peritoneal membrane either by diffusion alone or by combined diffusion and the solvent drag effect of a convective fluid flow although the blood flow limitation of the plasma-peritoneal exchange of solutes cannot be excluded.

3243 STUDIES ON THE RELEASE OF BRADYKININ BY THE SPLANCHNIC CIRCULATION DURING ENDOTOXIC SHOCK. *(E.)* Shah, J. P. (Hahnemann Med. Coll., Philadelphia, Pa.), U. S. Shah, H. E. Appert and J. M. Howard. *J Trauma* 10(3):255-259, 1970.

Bradykinin concentrations in the femoral artery, portal and hepatic veins in dogs following endotoxin administration (1.5 mg/kg i.v.) were determined by the method of Brocklehurst and Zeitlin. Endotoxin reduced blood pressure from a normal value of 150 mm Hg to 40 to 60 mm Hg and bradykinin levels in portal and hepatic veins and femoral artery (normal values = 3.3, 3.0 and 2.6 ng/ml, resp.). Although the bradykinin level decrease was not statistically significant, the results are consistent with the concept that splanchic circulation is important in the activation of the kinin production systems.

3244 TRANSPERITONEAL EXCHANGE: II. PERITONEAL BLOOD FLOW ESTIMATED BY HYDROGEN GAS CLEARANCE. *(E.)* Aune, S. (Ulleval Hosp., Oslo, Norway). *Scand J Gastroent* 5(2):99-104, 1970.

The peritoneal blood flow was estimated by measuring polarigraphically the removal of hydrogen gas from a perfusion fluid volume injected i.p. in rabbits. Total clearance of the hydrogen gas from the perfusion fluid was equal to the amount leaving the fluid per unit time and concentration gradient and during total clearance periods, mean arterial blood pressure varied between 96 and 120 mm of Hg. On the average, the hydrogen loss through the perfusion tubes corresponded to a clearance of 2.25 ml/min. The blood flow clearance of the peritoneal compartment ranged from 12.4 to 21.6 ml/min, with a mean of 17.04 ml/min. Blood flow was at least large enough not to influence the transperitoneal transport of solutes normally present in the blood (the main restriction to such transport is the permeability of the peritoneal membrane).

3245 EXPERIMENTAL STUDIES ON ACUTE STRANGULATED INTESTINAL OBSTRUCTIONS IN GERMFREE ANIMALS. *(E.)* Shirota, A. (Nippon Med. Sch., Tokyo, Japan), H. Yokota, H. Hattori, M. Onda, Y. Kiso, K. Yamashita, T. Shiba, Y. Moriyama, K. Adachi, M. Miyashita and K. Aihara. *Internat Surg* 53(3):223-229, 1970.

Completely germ-free 3-month-old ICR mice and a control group contaminated with *E. coli* were used to determine the role of the intestinal bacterial flora in death from acute intestinal obstructions. The survival time after experimentally-induced acute strangulated small intestinal obstructions, was 5-10 hr in the contaminated and 23-49 hr in the germ-free mice. There was no significant increase in the number of microorganisms in the contents of the closed intestinal loop of the germ free mice, but in the *E. coli* mice there was an exponential increase. Pronounced histological, and cytological changes (disappearance of microvilli, necrosis, dissociation of desmosomes in the intracellular spaces, swelling of mitochondria and disappearance of endoplasmic reticulum) in the intestinal loop were more evident in the *E. coli* mice. Liberation of lipopolysaccharide endotoxin of *E. coli* into the blood could not be found in the germ-free mice, but was clearly evident in the contaminated mice. Liberation of endotoxin into the blood may be closely related to the level of endotoxin in the intestinal contents.

3246 PLASMA SKIMMING IN THE INTESTINAL WALL. *(E.)* Jodal, M. (Dept. Physiol. U. Goteborg, Sweden) and O. Lundgren. *Bibliotheca Anat* 10:310-311, 1969.

3247 STUDIES ON IRON METABOLISM WITH A WHOLE BODY COUNTER. *(E.)* Saito, H. (Nagoya U. Sch. Med., Japan). *Jap J Nucl Med* 6(4):412-413, 1969.

3248 RECEPTOR ACTIVITY FOR PORCINE ENTEROVIRUSES IN PIG TISSUES. *(E.)* Derbyshire, J. B. (Agric. Res. Counc., Compton, Newbury, Berkshire, England) and D. M. Jessett. *J Med Microbio* 2(4):489-493, 1969.

3249 HEMODYNAMIC STUDIES OF THE ABDOMINAL ORGANS BY THE USE OF ^{131}IMAA AND ^{85}Kr. *(E.* Kitani, K. (2nd Dept. Int. Med., U. Tokyo, Japan). *Jap J Nucl Med* 6(4):403, 1969.

3250 PRESSURE PERMEABILITY RELATIONS IN CAPILLARIES OF THE RABBIT OMENTUM. *(E.)* Intaglietta, M. (Dept. Aerospace Mech. Engin. Sci. U. California, La Jolla). *Bibliotheca Anat* 10:238-240, 1969.

3251 LUMINESCENCE-MICROSCOPIC EVIDENCE FOR TH EXISTENCE OF A GRADIENT OF VASCULAR PERM ABILITY IN THE MESENTERY CAPILLARY BED. *(E.)* Hauc G. (Inst. Physiol., U. Wurzberg, Germany). *Bibliotheca Anat* 10:221-224, 1969.

3252 THE EFFECT OF DTPA AND CALCIUM ON THE TRANSLOCATION OF INTRAPERITONEALLY ADMINISTERED $^{239}PuO_2$ PARTICLES. *(E.)* Sanders, C. L. (Pacific Northwest Lab., Batelle Mem. Inst., Rich-

and, Wash.) and W. J. Bair. *Health Phys* 8(2):169-173, 1970.

253 IMMUNOLOGY IN GASTROINTESTINAL RESEARCH AND PATIENT CARE. *(E.)* McGuigan, J. E. U. Florida Sch. Med., Gainesville). *Amer J Surg* 19(2):111-117, 1970.

3254 BLOOD AND LYMPH VESSELS AND BODY FLUID FLOW IN THE LIVER. *(E.)* Nisimaru, Y. (Lab. Angiol., Tenno, Kure, Japan). *Hiroshima J Med Sci* 18(2-3):65-93, 1969.

3255 THE EFFECT OF ACETYLCHOLINE AND NOREPINEPHRINE ON NITROGEN METABOLISM IN THE GASTROINTESTINAL TRACT IN SHEEP. *(Rus.)* Soldatenkov, P. F. (Dept. Normal Path. Physiol., Agric. Inst., Sverdlovsk, USSR) and K. D. Yugayi. *Fiziol Zh SSSR Sechenov* 55(12):1493-1500, 1969.

3256 THE BACTERIAL FLORA AND GAS CONTENT OF THE SMALL INTESTINE. *(Nor.)* Bystrom, J. (Karolinska Hosp., Stockholm, Sweden). *Lakartidningen* 66(51):5391-5397, 1969.

3257 WATER IN RED BLOOD CELLS AND PLASMA OF MESENTERIC BLOOD. *(E.)* Nelson, R. A. (Mayo Clin., Rochester, Minn.), E. A. Ernst and H. F. McCorkle. *Amer J Dig Dis* 15(4):343-346, 1970.

3258 THE EFFECTS OF GRADED ELECTRICAL STIMULATION OR REFLEX ACTIVATION OF THE SYMPATHETIC AND THE PARASYMPATHETIC NERVE SUPPLY ON THE REGIONAL BLOOD FLOW IN CAT COLON. *(E.)* Hulten, L. (Dept. Physiol., U. Goteburg, Sweden), M. Jodal and O. Lundgren. *Bibliotheca Anat* 10:312-315, 1969.

3259 TRANS-HEPATIC VASCULAR RESISTANCE DURING PROLONGED ISOLATED LIVER PERFUSIONS. *(E.)* Abouna, G. M. (U. Colorado Med. Ctr., Denver, Colo.), T. Ashcroft and J. R. Young. *Brit J Surg* 56(12):921-925, 1969.

- P:Morph (3043) (3064)
- P:Absorp (3119)
- D:Gen (3723)

DIAGNOSTIC PROCEDURES

3260 THE RELATIONSHIP OF THE SERUM ALKALINE PHOSPHATASE TO URINARY HYDROXYPROLINE EXCRETION IN LIVER AND BONE DISEASES. *(E.)* Cerda, J. J. (VA Hosp. Philadelphia, Pa.), P. P. Toskes, N. A. Shopa and J. H. Wilkinson. *Clin Chem Acta* 27(3):437-443, 1970.

The value of simultaneous determination of serum alkaline phosphatase activity and 24-hr urinary hydroxyproline excretion in the differential diagnosis of bone *versus* liver hyperphosphatasemia (serum alkaline phosphatase greater than 40 IU/liter) was determined in 32 patients (19 with liver disease, 13 with bone disease). All patients with bone disease demonstrated elevations in both urinary hydroxyproline excretion and serum alkaline phosphatase activity while patients with liver disease (biliary cirrhosis, obstructive jaundice, cholestasis, steatonecrosis, hepatitis, sarcoid of liver, liver metastases) showed elevations only in serum alkaline phosphatase activity. There was an excellent correlation between urinary hydroxyproline excretion and the source (liver or bone) alkaline phosphatase isoenzymes in 4/5 patients with liver disease and 4 patients with bone disease. Urinary hydroxyproline excretion seemingly is a reliable method of selecting those patients whose elevated serum alkaline phosphatase is secondary to bone disease as opposed to liver disease.

3261 THE α-FETOPROTEIN TEST FOR LIVER CANCER. *(E.)* Shanmugaratnam, K. (no affil), K. L. Chua and C. S. Seah. *Singapore Med J* 10(4):230-232, 1969.

The presence of serum α-fetoprotein was investigated in 120 patients from Singapore (33 cases of hepatocellular carcinoma, 3 cases of embryonal carcinoma of the testis and 84 controls). The α-fetoprotein test was positive in 25 of the 33 (76%) cases of hepatocellular carcinoma, and in 2 of the 3 (66%) cases of embryonal carcinoma of the testis. All of the 84 controls (25 cases of cirrhosis, 2 cases of hepatitis, 2 cases of cholangiocellular carcinoma, 4 cases of secondary liver carcinoma, 24 cases of other cancers, and 27 cases of miscellaneous diseases) gave negative results.

3262 MODIFICATION OF PANCREATIC BLOOD FLOW WITH BALLOON CATHETERS: A NEW APPROACH TO PANCREATIC ANGIOGRAPHY. *(E.)* Reuter, S. R. (U. Hosp. San Diego, Cal.). *Radiology* 95(1):57-63, 1970.

In order to determine whether or not pancreatic angiography could be improved by using the pancreatic arteries as collateral vessels, 50 occlusive examinations were attempted in 22 patients and 20 superselective angiograms of the gastroduodenal, splenic or dorsal pancreatic arteries were performed in 12 patients. In 46 angiographic examinations, temporary occlusion of the celiac, hepatic, or superior mesenteric arteries with balloon catheters frequently improved visualization of arteries in and around the pancreas by causing pancreatic arteries to participate in the collateral blood supply to the occluded vascular bed. The best visualization of the entire pancreas resulted from celiac occlusion and superior mesenteric injection while hepatic occlusion and superior mesenteric injection improved visualization only in the head, since the splenic artery received its normal blood supply from the nonoccluded celiac artery. In 8 patients, small branches in the head of the pancreas were demonstrated on occlusive examinations which were not seen on combined study, and visualization was frequently equivalent to that found at gastroduodenal angiography. Studies obtained with hepatic occlusion and celiac injection were much less satisfactory than the combined celiac-superior mesenteric studies. Superselective gastroduodenal injections were performed in 10 cases: celiac occlusion with superior mesenteric injection in 4, superior mesenteric occlusion and celiac injection in 3, and hepatic occlusion and superior mesenteric injection in 3. A comparison of these examinations showed that the visualization was about equal in 5. In the other 5 gastroduodenal angiography was better both because of larger number of branches filled and a higher concentration of contrast medium in the branches in the head of the pancreas.

3263 DIAGNOSIS OF HEPATIC HEMANGIOMA WITH COMBINED SCANNING TECHNIQUE. *(E.)* Freemar L. M. (Albert Einstein Coll. Med., Yeshiva U., Bron N. Y.), R. G. Bernstein and D. B. Hayt. *Radiology* 95(1):127-128, 1970.

An upper gastrointestinal series performed on a 63-yr-old male presenting with progressive abdomina enlargements of several months duration showed a large left upper quadrant mass displacing the stomach forward, laterally and downward. A liver scan (120 μC colloidal ^{198}Au) demonstrated a massive hepatomegaly with evidence of a large intrahepatic space-occupying lesion, mainly in the left lobe. Selective celiac angiography with and without previous injection of epinephrine led to a suspecte diagnosis of either cavernous hemangioma or hepatoma. A hepatic blood pool scan performed 10 min after i.v. administration of 350 μC of ^{131}I-human serum albumin showed complete filling-in of the defects seen on the ^{198}Au scan. The diagnosis of hemangioma was then considered to be most possible and was confirmed at surgery. Combined liver-scanning technique may be helpful in differentiatin hemangiomata from other benign and malignant hepati masses.

3264 EVALUATION OF THE DOUBLE CONTRAST MEDIA TECHNIQUE FOR ORAL CHOLECYSTOGRAPHY. *(E.)* Palmer, V. (Portland, Oreg.) and A. Gault. *Radiol Techn* 41(5):284-287, 1970.

The combined use of iopanoic acid (Telepaque), sodium ipodate (Oragrafin Granules) and calcium ipodate (Oragrafin Capsules) as a double-contrast media for cholecystographic examination was tested in 112 patients. A standard dose of three grams telepaque and three grams Oragrafin Granules were administered after a fat-free dinner, about 10 to 14 hr before cholecystographic examination. Three hours before the examination one packet of

grafin Capsules was administered with no more
n one-quarter cup of water. Eighty-three gall
dders (80%) were visualized without need for
oncentrations, and seven (6%) were visualized
n the use of a fatty meal. Only three patients
plained of nausea. The reconcentrations per-
tage was previously 50% when using only three
ms of Telepaque and this percentage dropped to
when Telepaque, Oragrafin Capsules and Oragrafin
nules were used in combination.

5 GASTRIC SECRETION IN DUODENAL ULCER, WITH PARTICULAR REFERENCE TO THE DIAGNOSIS OF
LINGER-ELLISON SYNDROME. *(E.)* Kaye, M. D. (U.
orado Med. Ctr., Denver), J. Rhodes and P. Beck.
troenterology 58(4):476-481, 1970.

al and maximal acid secretion were measured in
stomachs of 90 patients with duodenal ulcer and
results analyzed with respect to three criteria
sal acid output, the ratio of basal to stimu-
ed acid concentration, and the ratio of basal
maximal acid output) now used in the diagnosis
Zollinger-Ellison syndrome. A basal acid output
ater than 15 mEq per hr, a ratio of basal to
mulated acid output greater than 0.6, and a
io of basal to maximal acid output greater than
were found, resp., in approximately 10, 2, and
of the patients. Because of the overlap be-
een patients with duodenal ulcer and those with
let cell tumor, no one of these criteria appar-
tly is entirely reliable in the differentiation
these two disorders.

66 SIMULTANEOUS MEASUREMENTS OF TOTAL PANCREATIC, BILIARY AND GASTRIC OUTPUTS IN
N USING A PERFUSION TECHNIQUE. *(E.)* Summerskill,
H. J. (Mayo Clin. Rochester, Minn.), V. L. W.
and A. F. Hoffman. *Gastroenterology* 58(3):
1-328, 1970.

rfusion of both gastric and duodenal markers with
llections from the stomach and duodenum was used
make simultaneous measurements of total duodenal
d gastric secretory outputs in man. Calculations
duodenal reflux into the stomach, of contamina-
on of duodenal contents by gastric contents, and
the amounts recycled between the organs were
de, and these values used to establish the ap-
ication of duodenal perfusion for precise measure-
nts of total secretions into the duodenum. Total
ncreatic enzyme (lipase, trypsin, amylase) output
ter intraduodenal perfusion of essential amino
ids was identical with that obtained after a maxi-
lly tolerated dose (0.125 and 0.250 Crick Harper
per units/kg/min for 4 hr) of i.v. administered
ncreozymin. Simultaneous intraduodenal and i.v.
timulation, however, caused a pancreatic enzyme
utput which significantly exceeded either method of
timulation alone, or any previously reported, there-
y suggesting that conventional stimuli cannot attain
aximal secretory capacity for enzymes. When this
echnique was applied to the determination of total
ilirubin output in the duodenum, a high bilirubin
utput which was consistent with previous reports
as observed.

3267 THE VITAMIN A ABSORPTION TEST: II. STUDIES ON CHILDREN AND ADULTS WITH DISORDERS IN THE ALIMENTARY TRACT. *(E.)* Kahan, J. (Soders Hosp., Stockholm, Sweden). *Scand J Gastroent* 5(1):5-12, 1970.

Children and adults (221) with alimentary tract disorders were given the vitamin A absorption test of Kahan and the results were compared with those of serum β-lipoprotein determination, butter-fat absorption test, and estimations of fecal fat. The maximum increment of the postabsorptive serum vitamin A level closely resembles the results of the fasting serum β-lipoprotein test and in cases of biliary obstruction (range 7 to 50 for control and 0.1 to 4 for diseased) and of malabsorption syndrome (range 7 to 50 for control and 0.1 to 8 for diseased) the levels were below those of the control groups. In celiac disease, cystic fibrosis pancreatic disorders, and after intestinal resection, pathological values were obtained in half the cases. Consideration of the β-lipoprotein results in the evaluation of the vitamin A test reduced the overlap between control and patient groups (especially in children). The vitamin A test correlated well with the butter-fat absorption test ($r = 0.64$, $p < 0.001$) and with the fecal fat estimations ($r = -0.64$, $p < 0.001$) and seemingly is a rapid screening procedure for the detection of malabsorption states and for the estimation of the efficiency of therapeutic measures.

3268 THE VALUE OF γ-GLUTAMYL TRANSPEPTIDASE AS A SCREEN TEST FOR LIVER TUMOR. *(E.)* Aronsen, K. F. (Malmo Gen. Hosp., Sweden), B. Nosslin and B. Pihl. *Acta Chir Scand* 136(1):17-22, 1970.

In 153 patients with cancer (76 with tumors of the liver verified at operation or post mortem and 77 without demonstrable involvement of the liver) determinations were made of the activities of serum γ-glutamyl transpeptidase, alkaline phosphatase and glutamate-pyruvate-transaminase and serum bilirubin. Various statistical methods (the difference index of Zieve and Hill, the critical value, and the discriminant function of Fisher) were used to evaluate the discriminative effectiveness of each test. Determination of the γ-glutamyl transpeptidase proved better than the other tests and gave a correct diagnosis in 90% of the cases, false positive results in 9% and false negative results in 1%, while combined use of the 3 enzyme reactions gave correct classification in 93%. Measurement of the γ-glutamyl transpeptidase appears to be a useful screen test for liver involvement in cancer patients.

3269 X-RAY TELEVISION INSTALLATION PROVIDED WITH A FULL SIZE ROLL FILM CHANGER FOR MASS SURVEY OF GASTROINTESTINAL DISEASES. *(E.)* Matsuda, H. (Ctr. Adult Dis., Osaka, Japan), A. Nakai, M. Miyachi, K. Ninomiya, M. Okazaki, Y. Hiura and Y. Sasaki. *Amer J Roentgen* 108(4):835-846, 1970.

A newly developed x-ray television installation, provided with full size roll film changer which was especially designed for mass survey of gastroduodenal diseases, is described. The superiority of the direct full size filming under television fluoroscopic control is discussed with regard to more roentgenographic information under less radiation exposure compared with the fluororadiographic methods using mirror or lens cameras and using the filming of an image intensifier output screen. One important alteration in the new device is utilization of plumbicon tube in place of vidicon tube. By use of the plumbicon camera a distinct reduction of patient dose from 4,000 mr per min of conventional fluoroscopy to 700 mr per min on skin is obtained.

3270 AN INSTRUMENT FOR TRANSDUODENAL SPHINCTEROTOMY AND BIOPSY OF THE DUODENAL PAPILLA. *(E.)* Larmi, T. K. I. (Dept. Surg., U. Oulu, Finland). *Ann Chir Gynaec Fenn* 58(4):334-335, 1969.

An instrument is described which simultaneously performs sphincterotomy and takes a biopsy specimen for subsequent histological study. The broadest part of the specimen taken for histological analysis derives from the tip of the papilla and the instrument has proved serviceable in biliary tract surgery, and no adverse effects on the patient have been noted from its use.

3271 CLINICAL EVALUATION OF A NEW FIBEROPTIC COLONOSCOPE. *(E.)* Dean, A. C. B. (Roy. Infirm., Edinburgh, Scotland) and D. J. C. Shearman. *Lancet* 1(7646):550-552, 1970.

A new diagnostic instrument (colonoscope), based on fiber optics instead of a lens system, was used to investigate 38 patients with intact colon or colostomy. The instrument is 1.3 cm in diameter, can be passed a maximum distance of 70 cm and has a controllable tip of 8 cm long which can be moved at 90° angle up or down in one plane. Examination of the large bowel with this flexible instrument is more extensive and more comfortable than with a rigid sigmoidoscope, especially in patients who have had operations on the colon. Useful information (small adenomas and Crohn's disease of the colon), which could not have been obtained by barium enema or routine sigmoidoscopy, was obtained in 8/40 examinations with this instrument.

3272 "FIBERDUODENOSCOPY"-- EARLY DIAGNOSIS OF CANCER OF THE PAPILLA OF VATER. *(E.)* Oi, I. (Tokyo Women's Med. Coll., Japan), T. Takemoto and K. Nakayama. *Surgery* 67(4):561-565, 1970.

3273 ACCIDENTS WITH IODINIZED OPAQUE SUBSTANCES IN BILIARY RADIOLOGY-THEIR PREVENTION. *(Fr.)* Hamidou, B. (C. H. U. Oran, France), J. Dorstal and M. Taleb. *J Med Chir Prat* 141(2):65-72, 1970.

3274 CONTRIBUTION OF SELECTIVE ARTERIOGRAPHY IN DIGESTIVE PATHOLOGY. *(It.)* Arianoff, A. A. (St. Elizabeth Clin., Brussles, Belgium) and G. Vielle. *Chir Gastroent* 3(4):418-442, 1969.

3275 GASTRIC ASPIRATION BIOPSY AND MAXIMAL HISTAMINE TEST IN HYPERTHYROID PATIENTS. *(Sp.)* Duhart, J. E. (Fac. Med. U. Buenos Aires, Argentina), C. E. Cerini, H. Obiglio, R. Ibarra an D. Gottlieb. *Medicina* 29(5):346-354, 1969.

3276 THE DIAGNOSTIC VALUE OF β-CAROTENE LOADI CURVES. *(It.)* Sategna-Guidetti, C. (Dep Gen. Clin. Med., Med. Ther., U. Turin, Italy), A. Pera, A. Palmo and T. Grassi. *Minerva Gastroent* 15(3):132-135, 1969.

3277 RADIOLOGIC DIAGNOSIS OF COLONIC DISEASE. *(E.)* Frederick, P. R. (Latter Day Saint Hosp., Salt Lake City, Utah). *J Abdom Surg* 12(4):50-52, 1970.

3278 PARADUODENAL HERNIAS: RADIOLOGIC AND ARTERIOGRAPHIC DIAGNOSIS. *(E.)* Meyers, M. A. (Flower Fifth Avenue Hosp., N.Y. Med. Coll., New York). *Radiology* 95(1):29-37, 1970.

3279 RESIDUAL CONTRAST MEDIUM IN THE INTESTIN AND SIDE EFFECTS DURING CHOLECYSTOGRAPHY A COMPARISON BETWEEN SOME CONTRAST MEDIA IN CURREN USE AND A NEW MEDIUM. (*E.*) Eriksson, S. (Radiol. Dept., U. Umea, Sweden) and G. F. Saltzman. *Acta Radiol* 10(1):69-75, 1970.

3280 LIVER BIOPSY BY THE METHOD OF MENGHINI. (*Nor.*) Ovlisen, B. (Bispebjerg Hosp., Copenhagen, Denmark) and H. Baden. *Nord Med* 83(10 297-299, 1970.

3281 A SPECTROPHOTOMETRIC TECHNIQUE FOR THE ASSAY OF THE IRONBINDING CAPACITY OF GASTRIC JUICE. (*It.*) Russo, G. (Inst. Clin. Pediat., U. Catania, Italy), S. Musumeci-Tuttobene, S. Musumeci-Belfiore and D. Mazzone. *Pediatria [Napl* 77(4):493-499, 1969.

3282 VALUE AND UTILITY OF DETERMINATIONS OF T FECAL FAT AND NITROGEN IN CHRONIC PANCREA TIC DISEASE. (*It.*) Bertero, R. (Dept. Med., U. Turin, Italy), C. Sategna-Giudetti and A. Palmo. *Minerva Gastroent* 15(3):105-111, 1969.

3283 DIAGNOSING PANCREATITIS THE FIRST DAY: COMPARISON OF URINARY AMYLASE AND SERUM ENZYMES IN PANCREATIC DYSFUNCTION. (*E.*) Seward, C. W. (Baptist Mem. Hosp., Oklahoma City, Okla.). *Southern Med J* 63(3):286-289, 1970.

3284 SCREENING FOR LIVER METASTASES. (*E.*) Berndt, H. (Robert Roessle Clin., Berlin, Germany). *Digestion* 2(6):354-357, 1969.

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- P:Morph (3086)
- D:Stomduo (3385)
- D:Stomduo:Peptulc (3403)
- D:Pancreas (3517) (3520) (3525)
- D:Livbil (3552) (3588)
- D:Livbil:A.Nonv.Hep (3614)
- D:Livbil:Gallb (3672) (3676)
- D:Gen (3705) (3725)
- D:Gen:Parasit (3768) (3788)

GASTROINTESTINAL DISEASES

ESOPHAGUS

12 MORPHOLOGY OF THE EPITHELIUM OF THE DISTAL ESOPHAGUS IN PATIENTS WITH MIDESOPHAGEAL PTIC STRICTURES. (*E.*) Trier, J. S. (Boston U. Sch. l., Mass.). *Gastroenterology* 58(4):444-461, 1970.

ltiple esophageal suction biopsies were obtained om 5 patients with midesophageal peptic strictures l studied by light and electron microscopy. All opsies from above the stricture were lined by uamous epithelium, and all from below were lined columnar epithelium, with the latter containing ree cell types. The most abundant was a columnar ithelial cell which contained many glycoprotein anules, and in which the apical surface consisted a brush border composed of many microvilli. Many cus-secreting goblet cells and a few chromaffin lls were also observed but no cells resembling stric parietal or chief cells. Biopsies from the stroesophageal junction from 2 normal subjects ffered from the distal esophageal epithelium of ricture patients in that surface cells contained ly sparse microvilli and more abundant secretory anules and intestinal type goblet cells were abnt.

13 PROLONGED pH RECORDING IN THE STUDY OF GASTRO-ESOPHAGEAL REFLUX. (*E.*) Spencer, (Hammersmith Hosp., London, England). *Brit J rg* 56(12):912-914, 1969.

method for continuous monitoring of esophageal l for periods of up to 18 hr was used to record e timing and duration of reflux in 15 patients th symptomatic sliding hiatal hernia, and in control subjects. A gastrointestinal glass pH ectrode was positioned to record at the junction the middle and lower thirds of the esophagus d reflux periods were considered to have curred if the pH was below 4. In 15 patients, aximal acid output (mEq/hr) was determined by e of i.v. histamine infusion, 0.04 mg/kg/hr, or m. pentagastrin 6g/kg. Mean 18-hr reflux periods ere significantly longer in the patients with iatal hernia (266.9 min. ± 282.3), than in the ontrol group (41.1 min. ± 17.0) and reflux occurred on the average) during 25% of the 18-hr recording n the hiatal hernia patients. Nocturnal reflux ccurred in the majority of patients with hiatal ernia, but in none of the control subjects. In ive control subjects with duodenal ulcer, there as a significant positive correlation between aximal acid output and the duration of reflux, ut no such correlation was present in patients with iatal hernia.

314 BLEEDING ESOPHAGEAL VARICES IN PATIENTS WITH WILSON'S DISEASE. (*E.*) Sternlieb, I. Albert Einstein Coll. Med., Bronx, N.Y.), I. H. cheinberg and J. M. Walshe. *Lancet* 1(7648): 38-641, 1970.

linical courses of 24 patients with Wilson's isease with bleeding esophageal varices are reviewed. Of 8 patients in whom portacaval shunts ere constructed, 1 died immediately following urgery, 5 died within 33 months, 1 patient died 8 yr following surgery after having experienced slow hepatic deterioration and late neurological disease, and 1 patient is well 2 yr postoperatively. Of the 9 patients receiving splenectomies and splenorenal shunts, 5 patients died within 2 yr while 4 are still alive. Splenectomy in 1 patient was followed by neurological deterioration, with no recurrence of bleeding and the patient is still alive 6 yr after surgery. One patient with gastric transection and another with porta-azygos disconnection died of recurrent hemorrhage. Of 4 patients who received no surgical treatment, 1 is alive, 2 died of recurrent hemorrhage and 1 died of progressive hepatic and neurological deterioration. Treatment with penicillamine or dimercaprol prevented neither initial bleeding nor postoperative neurological or psychiatric deterioration. Incidence and severity of neurological and emotional deterioration in patients with surgery are both significantly greater than in medically treated patients with Wilson's disease, but without esophageal hemorrhage. Surgical decompression of portal hypertension should seemingly be reserved for patients in whom recurrent and uncontrollable hemorrhage threatens life.

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3323 DYSPHAGIA. (*E.*) Harris, L. D. (Boston U. Med. Ctr., Mass.). *Adv Intern Med* 15: 203-219, 1970.

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3326 MULTIPLE ESOPHAGEAL DIVERTICULA ASSOCIATED WITH SPASM AND STRICTURE. (*E.*) Vigario, G. D. (U. Virginia Sch. Med., Richmond) and T. E. Keats. *Virginia Med Month* 97(4):220-221, 1970.

3327 SPLENECTOMY AND CORONARY VEIN LIGATION FOR THE CONTROL OF BLEEDING ESOPHAGEAL VARICES. (*E.*) Smith, G. W. (U. Virginia Med. Ctr., Charlottesville). *Amer J Surg* 119(2):122-131, 1970.

3328 PERFORATION OF THE ESOPHAGUS WITH THE GASTROCAMERA FIBERSCOPE. (*E.*) Anselm, K. (Henry Ford Hosp., Detroit, Mich.), J. M. Shartsis, N. V. Carandang and R. J. Priest. *Amer J Dig Dis* 15(4):311-315, 1970.

3329 ESOPHAGEAL RECONSTRUCTION BY COLON INTERPOSITION. (*E.*) Martini, N. (Mem. Hosp., N. Y., N. Y.), A. El-Domeiri and E. J. Beattie, Jr. *Arch Surg* 100(4):358-362, 1970.

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3332 SPONTANEOUS RUPTURE OF THE ESOPHAGUS. (*E* Salinas Izaguirre, S. F. (St. Barnabas Hosp., New York, N. Y.), J. T. Haggerty and G. Eckert. *Surge* 67(4):607-613, 1970.

3333 ACHALASIA CARDIA. (*E.*) Tolia, R. M. (Me Coll. S.S.G. Hosp., Baroda, India), P. A. Bhatt, B. T. Dave and B. K. Vyas. *J Indian Med Ass* 54(1) 26-27, 1970.

3334 TRANSABDOMINAL LIGATION-RESECTION OF THE ESOPHAGUS IN CASES OF BLEEDING ESOPHAGEAL VARICES. (*E.*) Boerema, I. (Amsterdam, Netherlands) P. J. Klopper and A. A. Holscher. *Surgery* 67(3): 409-413, 1970.

3335 SOME ANATOMICAL CONSIDERATIONS IN SLIDING HIATUS HERNIA. (*E.*) Melcher, D. H. (St. Thomas Hosp., London, England). *Brit J Surg* 56(12 904-906, 1969.

3336 CARCINOMA OF THE ESOPHAGUS AFTER GASTRIC SURGERY. (*E.*) Shearman, D. J. C. (Roy. Inf., Edinburgh, Scotland), N. D. C. Findlayson, S. J. Arnott and J. G. Pearson. *Lancet* 1(7647):58 582, 1970.

3337 ESOPHAGEAL AND GASTRIC DISORDERS IN DIABETES MELLITUS. (*Fr.*) Schrub, J. Cl. (Rouen, France), R. Laumonier, B. Hillemand and Y. Clabaut. *Sem Hop* 45(50):3161-3172, 1969.

- D:Livbil:Cirrh (3656)
- D:Gen (3712) (3728)

HIDDEN GASTRIC AUTOANTIBODIES TO INTRINSIC
FACTOR IN PERNICIOUS ANEMIA. (*E.*)
berg, L. S. (U. California Sch. Med., Los
les) and R. Bluestone. *J Lab Clin Med* 75(3):
456, 1970.

and gastric juices were analyzed for presence
ntibody to intrinsic factor (IF) in 12 patients
pernicious anemia (including one with coexist-
agammaglobulinemia). IF content of the eluted
s was greater than that of concentrated gastric
es, when 5 of gastric juice samples were frac-
ed by acidic gel filtration. IF was not detect-
n 8 of 12 unconcentrated gastric juice samples
subjects with pernicious anemia. Four specimens
ained 74, 80, 54 and 40 pg. of IF per 0.1 ml
and when concentrated samples of gastric juice
tested, larger amounts of IF (383 to 660 pg.
0.1 ml) were present in the 4 specimens but not
he other 8. Blocking antibodies were detected
of 12 concentrated samples of whole gastric
e (875 to 4,840 pg. per 0.1 ml); one of these
contained the binding antibody. Blocking anti-
was found in 4 additional specimens only after
ecting concentrated gastric juice to acidic gel
ration. Gastric antibodies were predominantly
immunoglobulins, except for one which appeared
e a secretory IgA antibody. Gastric juices of
ents with pernicious anemia apparently frequent-
ontain autoantibodies to IF as well as IF and
king autoantibodies and the IF seemingly exist
n antigen-antibody complex.

EFFECT OF PROLONGED ADMINISTRATION OF
PARIETAL CELL ANTIBODIES FROM PATIENTS
H ATROPHIC GASTRITIS AND PERNICIOUS ANEMIA OF THE
IETAL CELL MASS AND HYDROCHLORIC ACID OUTPUT IN
S. (*E.*) Jerzy Glass, G. B. (New York Med. Coll.,
York) and N. Tanaka. *Gastroenterology* 58(4):
-494, 1970.

d atrophic lesions (thinning of the mucosa, de-
ase of the mucosal volume and significant reduc-
n of parietal cell mass), without signs of in-
mmation or hypersensitivity, were produced in
tric mucosa of rats injected for 6 to 8 weeks
h immunoglobin G processed from sera of patients
h atrophic gastritis and pernicious anemia con-
ning circulating parietal cell antibody. The
allel between the reduction of the parietal cell
s and decrease of the mucosal volume, as well as
rease in the intrinsic factor activity of the
tric juice of rats treated for 8 weeks with parie-
cell antibodies containing immunoglobulin G,
gests concomitant reduction of peptic cell mass
er these circumstances. Rats treated with parie-
cell antibodies also demonstrated a profound
rease of the hydrochloric acid output, which was
e pronounced than was warranted by the coexisting
uction of the parietal cell mass. Parietal cell
ibodies may play a contributory role in the
ural history of gastric atrophic lesions in man
producing the reduction of cell mass and cell
put.

3340 STOMACH CANCER AND AIR POLLUTION: AN EXPERIMENTAL STUDY IN A PETROCHEMICAL AREA. (*E.*) Neal, J. (U. Texas Med. Branch, Galveston) and R. H. Rigdon. *Texas Rep Biol Med* 27(3):787-793, 1969.

Carcinogenic activity of air pollutant particles was observed in stomachs of CFW mice fed (in Purina chow) thermal carbon and lamp black, fiber glass filter and particulate matter obtained from the air in the vicinity of petrochemical plants. There was no significant weight change in mice fed various types of hydrocarbons. Papillomas and squamous cell carcinomas occurred in the squamous portion of the stomach with numbers ranging from 1-3 and small in size, but neoplasms were not present in remainder of gastrointestinal tract. Similar gastric tumors occurred in mice fed a control carbon diet. Carbon pigment was usually present in the gastrointestinal tract of mice fed carbon and lamp blacks but no inflammatory reaction was observed. Pulmonary adenomas were present in experimental and control groups (no significant difference in number between lung tumors in treated and control groups). Papillomas and papillary carcinomas readily occur in squamous portion of stomach of mice fed food pellets with benzo (a) pyrene added. The experimental model for carcinogen study in air pollutants would seemingly be useful in clinical and epidemiologic study of gastric cancer in air polluted areas.

3341 CHYLOUS ASCITES FOLLOWING RESECTION OF AN ABDOMINAL AORTIC ANEURYSM. (*E.*) Bradham, R. R. (Roper Hosp., Charleston, S.C.), H. B. Gregorie and R. Wilson. *Amer Surg* 36(4):238-240, 1970.

A case report is presented of a 71-yr-old man who developed chylous ascites from a lymphatico-peritoneal fistula caused by resection of an adbominal aortic aneurysm. The course of management initially was that of repeated paracentesis and nutritional support with a high protein diet. Operative correction became necessary, and closure of multiple small leaking lymphatics was successful. Healing and recovery progressed rapidly and the patient had no further difficulty. There was no evidence of recurrent ascites 6 months later.

3342 HISTOCHEMICAL STUDY OF THE MUCOSUBSTANCES IN THE CANINE STOMACH: III. THE EFFECT OF CORTICOSTEROIDS. (*E.*) Lev, R. (New York Med. Coll., New York), H. I. Siegel and G. B. Jerzy Glass. *Gastroenterology* 58(4):495-508, 1970.

Prednisone (1.5 and 3.0 mg/kg for up to 8 weeks) was administered p.o. to 3 dogs with total gastric fistulas and mild chronic gastritis prior to treatment. Prednisone induced hyperplasia of mucous cells in the fundic and antral surface epithelium and increased synthesis of mucus by these cells and the extent of the hyperplastic response depended upon the dose of the drug and the length of time that it was administered. Prolonged treatment with prednisone resulted in erosions and one ulcer, and there was concomitant histological evidence of widespread mucosal damage such as the appearance of regenerative type cuboidal epithelium with reduced cytoplasmic mucus, exfoliation of surface cells, and inflammatory changes. In this experimental model, mucosal damage was preceded by increased rather than depressed mucus formation. It is suggested that the preexisting gastritis may have aggravated these changes and that this must be considered in the evaluation of results from histological and secretory studies using total gastric fistulae.

3343 BACTERIA, BILE, AND THE SMALL BOWEL. (*E.*) Tabaqchali, S. (Roy. Postgrad. Med. Sch., London, England) and S. L. Gorbach. *Gut* 10(12): 963-972, 1969.

Microbial population and bile salt metabolism at different levels of the alimentary tract were studied in 15 patients with disorders of the stomach and small intestine (4 with polya partial gastrectomy, 3 with single duodenal diverticulum, 4 with multiple jejunal diverticulosis, 2 with lesions of the distal small intestine, and 2 with resection of the distal small intestine). Although many patients had an extensive growth of microorganisms such as coliforms and lactobacilli throughout the small bowel irrespective of the causative lesion, the presence of anerobic microorganisms and free bile acids was related to local anatomical defects (areas of stagnation). The micro-environment (low oxidation-reduction potential) necessary for growth of microorganisms of the bacteroides group appears to be available in areas of intestinal stasis and this requirement is fulfilled in the colon or terminal ileum of normal subjects and in the stagnant area of small bowel in patients with diverticula, strictures, or blind loops. Treatment of 2 of these patients with lincomycin (specifically effective in eradicating the anerobic flora) led to a reduction in steatorrhea and disappearance of free bile acids from the intestinal fluid. Vitamin B_{12} malabsorption appeared to be related to the total number of bacteria colonizing the small bowel rather than to any specific type. In 1 patient, the broad-spectrum antibiotic tetracycline was effective in eradicating an abnormal bacterial flora.

3344 CARCINOMA AND INTESTINAL METAPLASIA OF THE STOMACH IN COLOMBIAN MIGRANTS. (*E.*) Correa, P. (Sch. Med. U. del Valle, Cali, Columbia), C. Cuello and E. Duque. *J Nat Cancer Inst* 44(2): 297-306, 1970.

3345 PREVENTION OF EXPERIMENTAL GASTRIC ULCER IN RATS BY A SUBSTANCE WHICH INCREASES BIOSYNTHESIS OF ACID MUCOPOLYSACCHARIDES. (*E.*) Ezer, E. (Gedeon Richter Chem. Works Pharmacol. Lab., Budapest, Hungary) and L. Szporny. *J Pharm Pharmacol* 22(2):143-145, 1970.

3346 PRIMARY GASTRIC AMYLOIDOSIS. (*It.*) Alagni, G. (Major Hosp. Trieste, Italy), L. A. Marin and M. Romani. *Chir Gastroent* 3(4):514-526, 1969.

3347 ALLERGIC GRANULOMATOSIS WITH MASSIVE GASTRIC INVOLVEMENT. (*E.*) Abell, M. R. (U. Michigan Med. Ctr., Ann Arbor), R. V. Limond, W. E. Blamey and W. Martel. *New Eng J Med* 282(12):665-66 1970.

3348 SOME UNUSUAL FEATURES OF GASTRIC ADENOMAS (*E.*) Kriss, N. (Geneva Gen. Hosp., N. Y. *Amer J Dig Dis* 15(2):103-110, 1970.

3349 VAGOTOMY, GASTRIC BLOOD FLOW, AND HEMORRHAGE FROM GASTRITIS. (*E.*) Olsen, W. R. (U. Michigan Med. Ctr., Ann Arbor), W. J. Foley and M. A. Simon. *Amer J Surg* 119(2):183-190, 1970.

3350 GASTRIC LIPOMA MIMICKING A GASTRIC MALIGNANCY. (*E.*) Reichbach, E. (Dept. Gastroent., U. Chicago, Ill.) and S. Kobayashi. *Amer J Dig Dis* 15(4):359-363, 1970.

3351 ROLE OF OCCULT BLOOD LOSS IN ANEMIA AFTER PARTIAL GASTRECTOMY. (*E.*) Baird, I. McL. (Alfred Hosp., Melbourne, Australia), D. J. B. St. John and S. S. Nasser. *Gut* 11(1):55-61, 1970.

3352 ACUTE PHLEGMASIA OF THE STOMACH. (*E.*) Stephenson, S. E. (Duval Med. Ctr., Jacksonville, Fla.), H. Yasrebi, R. Rhatigan and E. R. Woodward. *Amer Surg* 36(4):225-231, 1970.

3353 VAGOTOMY AND HEINECKE MIKULICZ PYLOROPLAS IN THE TREATMENT OF PYLORIC STENOSIS. (*E.* Rachlin, L. (VA Hosp., Livermore, Calif.). *Amer Surg* 36(4):251-253, 1970.

3354 ON THE QUESTION OF VAGAL REINNERVATION OF THE STOMACH: I. THE PERMANENCE OF THE AMOUNT OF THE RESIDUALLY INNERVATED GASTRIC MUCOSA. (*E.*) Jones, W. M. (U. Washington Sch. Med., Seattl and C. A. Griffith. *Ann Surg* 171(3):365-368, 1970.

3355 ON THE QUESTION OF VAGAL REINNERVATION OF THE STOMACH: II. THE UNCHANGING SECRETORY AND ULCEROGENIC POTENTIAL. (*E.*) Jones, W. M. (U. Washington Med. Sch., Seattle) and C. A. Griffith. *Ann Surg* 171(3):369-372, 1970.

3356 EXTREMELY NARROW GASTROENTEROSTOMY IN BILLROTH II AS DUMPING PROPHYLAXIS. (*E.*) Krook, S. S. (Dept. Surg. Lasarettet, Finspang, Sweden). *Acta Chir Scand* 136(1):64-67, 1970.

3357 IMPROVED OPERATIVE TECHNIQUE FOR GASTRIC DUPLICATION. (*E.*) White, J. J. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and W. W. Morgan. *Surgery* 67(3):522-526, 1970.

58 ARTERIOMESENTERIC OCCLUSION OF THE DUODENUM. *(E.)* Mork, F. E., Jr. inneapolis, Minn.). *Minnesota Med* 53(2):170-171, 70.

59 TWO CASES OF GASTRIC LYMPHOSARCOMA. *(It.)* Vota, L. (Civ. Hosp. Genoa, Italy) and Barbaro. *Pathologica* 61(893-894):37-44, 1969.

50 STUDIES ON CELL PROLIFERATION IN EARLY GASTRIC CANCER: COMPARISON OF LABELING DEX IN EARLY GASTRIC CANCER AND OTHER DISEASES THE STOMACH, AS JUDGED BY THYMIDINE H-3 TORADIOGRAPH. *(Jap.)* Kobayashi, J. (Sch. Med. nna U., Maebashi, Japan). *Kitakanto Med J* (2):112-128, 1969.

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52 GASTRITIS OF THE PYLORIC GLAND AREA AND GASTRIC ACID SECRETION. *(E.)* Ottenjann, (Dept. Intern. Med., U. Erlangen-Nuremberg, rmany), F. Paul, P. Dehyle and K. Elster. *gestion* 2(6):317-322, 1969.

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64 CHRONIC GASTRITIS AND MULTIPLE POLYPOSIS OF THE STOMACH ASSOCIATED WITH REGIONAL EITIS. *(Fr.)* Cornet, A. (Hosp. Laennec, Paris, ance), B. Hillemand, G. Terris, F. Carnot, J. P. rbier and D. Blanc. *Sem Hop Paris* 45(52):3327-38, 1969.

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3369 THE RELATIONSHIP BETWEEN THE CIRCULATION AND DISEASE OF THE STOMACH. *(E.)* Asano, K. (Okayama U. Med. Sch., Japan). *Jap J Nucl Med* 6(4):402-403, 1969.

3370 GASTRIC EMPTYING FOLLOWING FINNEY PYLOROPLASTY AND VAGOTOMY. *(E.)* Ludwick, J. R. (U. Michigan Med. Ctr., Ann Arbor), J. N. Wiley and P. Blass. *Amer J Dig Dis* 15(4):347-352, 1970.

3371 DETECTION OF PATIENTS PREDISPOSED TO THE DUMPING SYNDROME BY A SIMPLE PREOPERATIVE TEST. *(Fr.)* Rignault, D. (Paris, France), D. Moine, J. Terquem and F. Flabeau. *Presse Med* 77(52):1939-1940, 1969.

3372 DUODENAL CARCINOMA ASSOCIATED WITH LANGERHANS ISLETS TUMORS AND WITH THE ZOLLINGER-ELLISON SYNDROME. *(Fr.)* Gorin, J. P. (Hosp. Cochin, Paris, France), G. Lemaigre, C. Levy, J. Guerre, M. Roux and L. Leger. *J Chir* 98(5):485-502, 1969.

3373 MESENCHYMAL TUMORS OF THE STOMACH. *(E.)* Salmela, H. (2nd Surg. Clin., U. Helsinki, Finland). *Scand J Gastroent* 5(2):81-83, 1970.

3374 CLOSURE OF THE DUODENAL STUMP IN GASTRIC SURGERY. *(It.)* Ciccolini, A. (Maria Vittoria Hosp., Turin, Italy). *Gazz Med Ital* 128(11):662-666, 1969.

3375 CROHN'S DISEASE OF THE STOMACH: REVIEW OF THE LITERATURE IN CONNECTION WITH ONE CASE. *(Fr.)* Dupuy, R. (Hosp. Beaujon, Clichy, France), P. Duret, J. Vallin and J. Thiroloix. *Arch Franc. Mal Appar Dig* 59(1-2):29-38, 1970.

3376 POST-VAGOTOMY DIARRHEA? *(E.)* Franklin, R. H. (Roy. Postgrad. Med. Sch., London, England). *Brit Med J* 1(5693):412, 1970.

3377 THE USE OF A TRIPLE LUMEN GASTRIC TUBE FOR SUCTION AND FEEDING. *(E.)* Casten, D. F. (St. Clare's Hosp., New York, N. Y.). *Surg Gynec Obstet* 130 (4):696-700, 1970.

3378 PLASMA CELL GRANULOMA OF THE STOMACH: A REPORT OF A CASE AND REVIEW OF THE LITERATURE. *(E.)* Soga, J. (U. Niigata Sch. Med., Japan), K. Saito, N. Suzuki and T. Sakai. *Cancer* 25(3):618-625, 1970.

3379 LOCAL GASTRIC HYPOTHERMIA IN GASTRODUODENAL HEMORRHAGE. *(E.)* Petrov, B. A. (Sklifosovsky Emer. Surg. Inst., Moscow, USSR) and N. N. Korenev. *Surgery* 67(4):574-576, 1970.

3380 PRELIMINARY EXPERIENCE WITH VANAMIL, A NEW ANTACID. *(E.)* Riegel, N. (Bergen Pines Gen. Hosp., Paramus, N. J.). *Curr Ther Res* 12(3):161-169, 1970.

3381 RESTORING THE HEALTH OF DIGESTIVE FISTULA PATIENTS. *(E.)* Prodescu, V. (Brancovenesc Hosp., Bucarest, Rumania), R. Florescu, P. Toma and R. Dandescu. *Internat Surg* 53(3):218-222, 1970.

3382 TREATMENT OF DYSPEPSIA WITH AETHACRIDIN. *(Ger.)* Wallnofer, H. (A. O. Hosp. Vocklabruck, Germany) and K. Tauber. *Munchen Med Wschr* 112(6):248-252, 1970.

3383 RESTORATION OF THE GASTROINTESTINAL TRACT CONTINUITY IN GASTRIC RESECTION AND THE CARBOHYDRATE METABOLISM. *(Rus.)* Seniutovich, V. F. (Ivan Franko Med. Inst., Kiev, USSR) and Z. G. Sikor. *Klin Khir* 52(1):36-41, 1970.

3384 THE CONDITION OF THE STOMACH IN MAJOR CARDIOVASCULAR DISEASES. *(Rus.)* Grigorian, E. G. (Yerevan Med. Inst., Armenia, USSR). *Ter Arkh* 41(12):8-13, 1969.

3385 ELECTROGASTROGRAPHY FOR GASTRIC MOTILITY IN THYROTOXICOSIS. *(Rus.)* Synovets, A. S. (Pirogov Med. Inst., Odessa, USSR) and G. A. Sorokin. *Vestn Khir* 102(12):31-33, 1969.

3386 OPERATIONS ON THE PAPILLA DUODENI MAJOR. *(Rus.)* Mamamtavrishvili, D. G. (Tiflis Inst. Postgrad Med. Educ., USSR). *Klin Khir* 52(1):42-43, 1970.

- P:Motil (3127)
- Diagproc (3272) (3291) (3293) (3296) (3303) (3304)
- D:Esoph (3336) (3337)
- D:S.Intest (3420) (3433)
- D:L.Intest (3468)
- D:Livbil (3549) (3569)
- D:Livbil:Gallb (3692)

STOMACH AND DUODENUM

Peptic Ulcers

3387 REDUCTION OF THE ACID RESPONSE TO PENTAGASTRIN BY 1-HYOSCYAMINE IN ULCER PATIENTS. *(E.)* Borg, I. (Almanna Hosp., Malmo, Sweden) and S. Emas. *Scand J Gastroent* 5(2):149-153, 1970.

The effect of l-hyoscyamine (0.4 to 2.8 mg/8 hr p.o.) on the acid response to pentagastrin (6 µg/kg s.c.) was studied by gastric secretory tests (method of Emas, Lilja and Borg) in 27 gastric and duodenal ulcer patients. Treatment with l-hyoscyamine reduced the retained acid amount by 68% (from 2.53 to 0.80 mEq), the mean basal acid output by 67% (from 2.14 to 0.17 mEq/30 min), lowered the mean curve for acid output (maximal output 7.60 to 5.14 mEq/15 min, time independent maximal output 9.89 to 7.38 mEq/15 min, and mean peak output 16.30 to 11.58 mEq/30 min), and reduced the acid concentration of the retained gastric juice (47.6%), basal secretion (31.8%), and secretory acid (14.3%).

3388 AMINOTRANSFERASES IN CASES OF GASTRIC ULCERS: I. "AMINOTRANSFERASE PATTERN" OF A NATIVE HOMOGENATE AND SUBCELLULAR FRACTIONS OF THE HUMAN GASTRIC MUCOUS MEMBRANE. *(E.)* Jaroszewicz, L. (Med. Acad. Bialystok, Poland), K. Zwierz and J. Popowicz. *Digestion* 2(6):323-328, 1969.

The 'aminotransferase pattern' was determined for native homogenate and subcellular fractions prepared from mucosa samples obtained after gastrectomy on gastric ulcer patients. Transaminase activity (measured as µM glutamic acid/mg protein) in native homogenate was highest for alanine (1.27 ± 0.64), leucine (0.91 ± 0.33), aspartic acid (0.85 ± 0.46), isoleucine (0.77 ± 0.29) and valine (0.72 ± 0.27). Transamination rate of methionine was considerably lower (0.21 ± 0.08) while other amino acids had neglible activity. There were no enzymes found which reacted with histidine in human gastric mucosa.

In mitochondrial fraction from gastric mucosa, there was a high level of aspartate aminotransferase activity while a somewhat lower activity of alanine, leucine, isoleucine, and valine aminotransferases was observed. Development of methods for determination of alanine, aspartate and branched chain amino acid aminotransferases in human gastric juice is seemingly warranted in order to establish a relation between their activity and presence of pathological states in the stomach wall.

3389 DRUG EFFECTS ON GASTRIC SECRETION AND STRESS GASTRIC HEMORRHAGE IN THE RAT. *(E.)* Brodie, D. A. (Merck Inst. Ther. Res., West Point, Penn.), V. J. Lotti and B. G. Bauer. *Amer J Dig Dis* 15(2):111-120, 1970.

The development of a simple rapid technique for placing drugs into male Holtzman rat lateral cerebral ventricle permitted comparison of i.v. and intracerebroventricular drug administration on gastric acid secretion and stress-induced (by cold plus restraint) gastric hemorrhage. The anticholinergic drugs, atropine sulfate and atropine methylbromide, produced inhibition of gastric secretion when administered i.v. or intracerebroventricularly and were more effective in reducing volume than in reducing acidity of gastric secretion. Clonidine (16.0 μg), a centrally acting antihypertensive agent, reduced gastric secretion volume to 0.4 ml after i.v. administration and to 0.8 ml after intracerebroventricular administration from a control value (saline injection) of 4.9 ml for both routes of administration. The antisecretory activity of three CNS depressants, chlorpromazine, chlordiazepoxide and imipramine, was greater by i.v. than by intracerebroventricular administration. All stomachs of control animals subjected to 2 hr of cold-plus-restraint showed gastric hemorrhage and atropine sulfate and atropine methylbromide effectively reduced stress-induced gastric hemorrhage after i.v. or intracerebroventricular administration. Atropine sulfate (256.0 μg) administered i.v. inhibited 37.5% of stress-induced hemorrhage, while intracerebroventricular administration inhibited gastric hemorrhage by 87.5%.

3390 THE ORIGIN OF IRON CHELATING FACTORS IN GASTRIC JUICE. *(E.)* Scott, J. M. (Biomed. Res. Lab., Trinity Coll., Dublin, Ireland) and D. G. Weir. *Irish J Med Sci* 2(11):553-558, 1969.

The iron binding capacity (expressed as a ratio to the basal value) of gastric secretion stimulated with a continuous histamine infusion (40 μg/kg/hr) in patients with duodenal peptic ulcers was determined by the method of Morgan, Weir, Gatenby and Scott. The ratios of the first and second post histamine hr (1.14 and 1.14, resp.) were essentially unity, but for a "flushed gastric secretion" obtained by washing the stomach for 3 to 4 min after collecting basal secretion, the ratio was highly significant (1.93). Flushing is known to stimulate mucus secretion and from what is known of the properties of gastric iron binding, this capacity is apparently of mucoid origin.

3391 DUODENAL INHIBITION OF GASTRIC SECRETION BY OSMOTIC AGENTS IN NORMAL SUBJECTS AND PATIENTS WITH DUODENAL ULCER. *(E.)* Ward, A. S. (Queen Elizabeth Hosp., Birmingham, England), R. A. Wilkins, R. Cockel and C. W. O. Windsor. *Gut* 10(12):1020-1028, 1969.

The effect on gastric secretion of test solutions of saline (0.09 and 3%) and glucose (18.5%) infused into the distal duodenum over a 4 min period after stimulation with pentagastrin (6 μg/kg/hr i.v.) was evaluated by measuring the secretory volume, acid, pepsin and electrolyte concentrations. With the hypotonic saline and the hypertonic glucose, acid output was reduced in both control and ulcer groups but with the hypertonic saline, output was reduced in the ulcer group with no change in the controls. In all cases, the responses were rapid (immediate or within 5 min from the start of the infusion) and the hydrogen ion concentration was constant suggesting that the inhibition of acid was due to the decreased volume of gastric juice. Sodium, chloride and potassium concentrations remained constant in all the groups while pepsin output and concentration were both reduced by all 3 test solutions. Since the responses to varying duodenal osmolarity are similar in control subjects and duodenal ulcer patients, there is no evidence of impaired inhibition in the ulcer group.

3392 EFFECT OF PROTEASE INHIBITORS ON EXPERIMENTAL PEPTIC ULCERATION. *(E.)* Ellis, C. M. (U. Minnesota Hosp., Minneapolis), J. G. Lunseth and D. M. Nicoloff. *Amer J Surg* 119(2): 213-216, 1970.

The effects of various protease inhibitors were studied in 70 adult dogs in which chronic peptic ulceration similar to that seen in man was produced by placing the antrum on the colon as an antiperstaltic diverticulum. In the control group (given gelatin capsules), ulcers developed in 8 of the 10 dogs (6 had perforated ulcers). In the group receiving carrageenan, ulceration developed in 2 of the 10 dogs and both ulcers perforated. When SN-263 (sulfated amylopectin) was given, ulceration developed in 3 of the 10 dogs with perforation developing in 2 dogs. In the group receiving charcoal, ulcers developed in 4 of 10 dogs with perforation in 2 dogs. In the group receiving antacids, 5 dogs had ulcers and all were perforated; the size and numbers of ulcers were the same as the control group. In the group receiving cellulose sulfate, 8 of 10 dogs had ulcers with perforation occurring in 7; the size and number of the ulcers were the same as the control group. All 10 dogs receiving Amberlite IRC-50 showed severe ulceration and perforation and the average number of ulcers per dog was almost three times that of the control group and all of the dogs in this group died within a 2-3 week period. Protease inhibitors may be considered in the treatment of chronic peptic ulceration in man.

3393 ELECTROPHORETIC HETEROGENITY AND RELATIONSHIPS OF PEPSINOGENS IN HUMAN URINE, SERUM AND GASTRIC MUCOSA. *(E.)* Samloff, I. M. (Harbor Gen. Hosp., Torrance, Calif.) and P. L. Townes. *Gastroenterology* 58(4):462-469, 1970.

The molecular forms of pepsinogen (Pg) in urine and their relations to six of the seven pepsinogens in gastric mucosa were studied in 180 patients with known renal or peptic ulcer disease by agar-gel electrophoresis. Of these patients, 152 excreted Pg 2, Pg 3, Pg 4, and Pg 5 and 28 excreted only Pg 2, Pg 3, and Pg 4. These two patterns which have been designated A and B, respectively, were absolutely constant among individual patients. Of 23 patients from whom gastric mucosa was available, 19 had Pg 2, Pg 3, Pg 4, and Pg 5 in both their mucosa and urine, while 3 had only Pg 2, Pg 3, and Pg 4. Pg 6 and Pg 7 (or both) were found in the urine of only 8 of the 180 control subjects (5 of whom had proteinuria) and in 13 of 15 patients with renal disease and proteinuria. The demonstration of Pg 6 and Pg 7 in serum and the failure to find an inhibitor of these zymogens in normal urine is due neither to their failure to enter the circulation nor to their inhibition by urine.

3394 THE EFFECT OF 1-HYOSCYAMINE ON PENTAGASTRIN-INDUCED SECRETION OF ACID AND PEPSIN IN MAN. *(E.)* Walan, A. (Sahlgren Hosp., U. Goteborg, Sweden) and G. Dotevall. *Scand J Gastroent* 5(2): 135-142, 1970.

3395 A COMMENTARY ON PEPTIC ULCER. *(E.)* Jones, F. A. (no affil). *London Clin Med J* 11(1):13-20, 1970.

3396 RESULT AND CONSIDERATIONS ON THE INTRAOPERATIVE STUDY OF THE GASTRIC SECRETION IN ULCER DISEASE. *(It.)* Grassi, G. (United Hosp. Rome, Italy), C. Orecchia, I. Cantarelli, E. Fivoli and B. Sbuelz. *Chir Gastroent* 3(4):465-474, 1969.

3397 THE EPIDEMIOLOGY OF PEPTIC ULCER IN CHILDHOOD. *(E.)* Sultz, H. A. (Sch. Med. St. U. New York, Buffalo), E. R. Schlesinger, J. G. Feldman and W. E. Mosher. *Amer J Publ Hlth* 60(3): 492-498, 1970.

3398 GASTRIC RESECTION FOR DUODENAL ULCER IN WOMEN: A FOLLOW-UP STUDY. *(E.)* Lauen, O. (Aker Hosp., Oslo, Norway). *J Oslo City Hosp* 20(2): 28-31, 1970.

3399 SURGICAL MANAGEMENT OF PEPTIC ULCER. *(E.)* Savage, L. E. (U. South Dakota Sch. Med., Yankton) and C. B. McVay. *Amer J Surg* 119(2): 191-196, 1970.

3400 CORROSIVE INJURIES OF THE STOMACH. *(E.)* Allen, R. E. (San Francisco Gen. Hosp., Calif.), M. J. Thoshinsky, R. J. Stallone and T. K. Hunt. *Arch Surg* 100(4):409-413, 1970.

3401 EMPHASIS ON SURGICAL TECHNIC AND JUDGMENT IN THE MANAGEMENT OF GASTRIC ULCERS. *(E.)* Herrington, J. L. Jr. (Vanderbilt U. Med. Ctr., Nashville, Tenn.). *Amer Surg* 36(4);183-197, 1970.

3402 SURGERY FOR DUODENAL AND GASTRIC ULCER IN INFANCY AND CHILDHOOD. *(E.)* Strode, J. E. (Straub Clin. Honolulu, Hawaii) and J. F. Balfour. *Surgery* 67(3):527-535, 1970.

3403 CORRELATION BETWEEN RADIOLOGICAL FINDINGS IN THE STOMACH AND DUODENUM AND GASTRIC ACID SECRETION IN PATIENTS WITH PEPTIC ULCER DISEASE. *(E.)* Andersson, H. (Sahlgren Hosp., U. Goteborg, Sweden), G. Dotevall, H. Lingaas and A. Walan. *Scand J Gastroent* 5(2):123-128, 1970.

3404 INFLUENCE OF AGE AND ABO BLOOD GROUPS IN THE PRECIPITATION OF BLEEDING PEPTIC ULCERS. *(E.)* Berg, M. (Michael Reese Hosp. Med. Ctr., Chicago, Ill.). *Gut* 10(12):1029-1030, 1969.

3405 SELECTIVE GASTRIC VAGOTOMY ASSOCIATED WITH ANTRECTOMY IN THE SURGERY OF DUODENAL ULCER: IMMEDIATE RESULTS. *(Por.)* Chacon, J. P. (Surgical D., Medical School, Sao Paulo, Brazil). *Rev Ass Med Brasil* 15(1):19-25, 1969.

3406 RECENT TRENDS IN GASTRO-DUODENAL ULCER SURGERY. *(Nor.)* Krause, U. (U. Hosp. Uppsala, Sweden). *Nord Med* 83(3):65-73, 1970.

3407 SULPIRIDEX AND GASTRO-DUODENAL ULCER SYNDROMES: TRIAL THERAPY IN 48 CASES. *(Fr.)* Felix, H. (Lyon, France), A. Maillard, M. Legendre and J. Giraud. *Arch Franc Mal Appar Dig* 59(1-2):39-50, 1970.

3408 218 PARTIAL GASTRECTOMIES FOR DUODENAL ULCER FOLLOWED BY GASTRO-DUODENAL ANASTOMOSIS. *(Fr.)* Robert, J. (no affil), A. Tounsi, N. Benyahia, O. Cherkaoui, L. Balafrej, P. Desvignes and Robineau. *Montpellier Chir* 15(3):215-219, 1969.

3409 DEVELOPMENTS IN NON-CHOLINERGIC ANTI-ULCER AGENTS. *(E.)* Butler, D. E. (Parke, Davis Co., Ann Arbor, Mich.), R. A. Purdon and P. Bass. *Amer J Dig Dis* 15(2):157-170, 1970.

3410 BASAL AND POST HISTAMINE ACID OUTPUTS IN CONTROL SUBJECTS AND PATIENTS WITH DUODENAL ULCER. *(E.)* Devi, C. S. (Med. Coll. Kurnool, India), A. K. Chari, G. Devasankaraiah, G. Rao and S. Naidu. *Indian J Med Sci* 23(12):641-647, 1969.

3411 GASTRIC RESECTION FOR THE REMOVAL OF DUODENAL ULCER. *(Rus.)* Faddayev, A. D. (Cherkossk Reg. Hosp., USSR). *Klin Khir* (12): 46-47, 1969.

3412 REPEATED OPERATIONS IN GASTRIC AND DUODENAL ULCER. *(Rus.)* Shor, L. M. (Kaliningrad Reg. Hosp., USSR), L. V. Savich, A. Ya. Danilov and V. A. Kosov. *Klin Khir* (12):47-50, 1969.

3413 THE PATHOGENESIS OF THROMBOEMBOLI AND HEMORRHAGE IN CANCER AND ULCER OF THE STOMACH AND DUODENUM. *(Rus.)* Kalchenko, I. I. (Kiev Inst. Postgrad. Med., USSR), P. V. Lys and P. A. Ryabyi. *Klin Khir* (12):18-24, 1969.

3414 GASTRIC SECRETION OF POTASSIUM, SODIUM, CALCIUM, AND PHOSPHORUS FOLLOWING STIMULATION BY HISTAMINE AND PEPTAVLON. *(E.)* Aagaard, P. (U. Hosp., Copenhagen, Denmark) and J. Christiansen. *Scand J Gastroent* 5(2):155-160, 1970.

- P:Absorp (3102)
- Diagproc (3265) (3270) (3287) (3288) (3294)
- D:Esoph (3313) (3325)
- D:Gen (3712)

SMALL INTESTINE

3415 FETAL GASTROINTESTINAL OBSTRUCTION: PRENATAL DIAGNOSIS BASED ON AMNIOTIC FLUID ANALYSIS. *(E.)* Grimes, L. D. (U. Alabama Med. Ctr., Birmingham) and G. Cassady. *Amer J Obstet Gynec* 106(8):1196-1200, 1970.

The case reports of 4 pregnant women are described in whom the triad of hydramnios, elevated amniotic fluid bilirubin, and fetal small bowel obstruction were confirmed. Hydramnios and Zone II or III amniotic fluid spectral curves led to prenatal suspicion of fetal gastrointestinal obstruction (duodenal atresia in 3 fetuses and ileal atresia in 1) in all 4 patients. Definitive prenatal diagnosis of gastrointestinal obstruction was achieved in 2 patients in whom visualization of contrast media in the gut was not achieved following amniography in active, nonanemic, normocephalic fetuses. Three of the four fetuses were born live and the findings suspicioned by amniotic fluid spectral curves enabled rapid diagnosis and definite management of the intestinal obstruction in the newborn infants.

3416 SMALL BOWEL MORPHOLOGY IN EXPERIMENTAL CANINE CHOLERA: A LIGHT AND ELECTRON MICROSCOPIC STUDY. *(E.)* Elliott, H. L. (Johns Hopkins U. Sch. Med., Baltimore, Md.), C. C. J. Carpenter, R. B. Sack and J. H. Yardley. *Lab Invest* 22(2):112-120, 1970.

Small bowel morphology in experimental cholera was observed in 8 mongrel dogs undergoing serial full thickness jejunal and ileal biopsies performed prior to peroral infection with live *Vibrio cholerae* (controls were similarly treated). In the absence of treatment (fluid replacement therapy), no differences were seen by light or electron microscopy between control biopsies and those during cholera diarrhea, except for minimal acute inflammation around the crypts. During i.v. fluid therapy and maximal stool flows, dilation of capillaries by plasma and edema of lamina propria were seen in villus tips, and heightened goblet cell mucus production and loss were seen in dilated crypts. Results confirm previous demonstrations of epithelial integrity during human cholera diarrhea and the primary target of cholera exotoxin seemingly is the crypt epithelium which represents the chief site of net fluid loss in cholera.

3417 MECONIUM ILEUS AND ITS COMPLICATIONS: A REAPPRAISAL OF PLAIN FILM ROENTGEN DIAGNOSTIC CRITERIA. *(E.)* Leonidas, J. C. (Mt. Sinai Sch. Med., New York, N. Y.), W. E. Berdon, D. H. Baker and T. V. Santulli. *Amer J Roentgen* 108(3): 598-609, 1970.

Sixty patients with documented cytic fibrosis and meconium ileus were reviewed with special emphasis on their clinical and roentgenographic findings. Twenty-four patients had uncomplicated meconium ileus; 9 of these cases had a family history of cystic fibrosis. Roentgenographic examination prior to surgery showed a constant finding of uneven distention of intestinal loops (some were markedly dilated). Two patients were also found with incomplete intestinal obstruction at birth. In the complicated meconium group of 36 patients, complications occurred during prenatal period with characteristic sequelae of bowel obstruction by normal meconium. Nine patients had simple volvulus, whereas 23 had combined volvulus, gangrene, atresia, and peritonitis. Eleven patients exhibited calcification (meconium peritonitis) and small intestinal atresia. Traditional plain film roentgen criteria for meconium ileus (bubbly-granular pattern, absence of air-filled levels) were found absent in many "uncomplicated" cases, while these criteria were confusingly present in some "complicated" cases. In "uncomplicated" cases, major problem was the inability to accurately distinguish small bowel from colon obstruction without barium enema examination, while in "complicated" cases, the major problem was inability to suspect complications unless calcifications or mass effect of volvulus could be seen. The bizarre and broad range of roentgen findings reflects varying prenatal intestinal problems secondary to distal ileal meconium obstruction. Meconium ileus prognosis is grave with only 9 of 24 patients with uncomplicated [illegible] alive [illegible] months following surgery; 5 patients currently alive. Of the complicated cases, 18 of 36 survived longer than 1 month with only 10 currently alive.

3418 EVALUATION OF THE EFFICIENCY OF BILE SALT RECIRCULATION IN PATIENTS WITH TERMINAL ILEOPATHIES BY MEANS OF DEOXYCHOLATE DETERMINATION IN DUODENAL ASPIRATES.

(E.) Thaysen, E. H. (Aalborg Munic. Hosp., Denmark), A. Brüusgaard and B. Eriksen. *Scand J Gastroent* 5(1):39-47, 1970.

Deoxycholate concentration (mg/100 ml) in fasting duodenal aspirate following cholecystokinin stimulation (1.00 Ivy Dog Unit/kg i.v.) was determined by the method of Szalkowski and Mader in 6 ileectomized patients, 5 patients with terminal ileitis and 8 controls. The mean maximum deoxycholate concentrations for both the ileectomized group (79) and the terminal ileitis group (148) were significantly below that of the controls (335). The hypothesis that this indicates a compromised intestinal reabsorption of bile salts is further supported by the low serum cholesterol concentrations and the presence of steatorrhea in most of the patients examined.

3419 THE INTESTINAL INSULINOTROPIC ACTION AFTER JEJUNO-ILEOSTOMY.

(E.) Rehfeld, J. F. (Bispebjerg Hosp., Copenhagen, Denmark), E. Juhl and F. Quaade. *Scand J Gastroent* 5(1):77-80, 1970.

Glucose tolerance tests (p.o. and i.v.) were run on 3 patients before and after undergoing jejuno-ileostomy (preserving 37 cm of functioning jejunum and 12 cm of the distal ileum). In the oral glucose tolerance test, preoperatively 2 patients responded normally (1 patient was considered diabetic with a 3 hr value greater than 120 mg%), while postoperatively none of them had a rise and the immunoreactive insulin showed a rise both times (confirmed that the rise is greater after p.o. than after i.v. glucose). Glucose concentrations and insulin responses were almost identical before and after the operation for the i.v. tests. An intestinal β-cell stimulation located in the duodenum and first part of the jejunum apparently does exist.

3420 THE SMALL INTESTINE IN VITAMIN D DEPENDENT RICKETS.

(E.) Hamilton, R. (Hosp. Sick Child., Toronto, Ontario, Canada), J. Harrison, D. Fraser, I. Radde, R. Morecki and L. Paunier. *Pediatrics* 45(3):364-373, 1970.

Small intestinal function (calcium, phosphorus and magnesium balance studies) and structure (biopsy) were studied in 6 children with vitamin D dependent rickets after vitamin D therapy and in 1 child before treatment. No symptoms of intestinal malabsorption or abnormalities (studied by light and electron microscopy) in the duodenal mucosa were detected in the treated children or in the untreated child. Comparison of data on the child examined before and after therapy revealed a rise in serum calcium ([illegible] to 12.[illegible] mg/100 ml), exchangeable pool calcium (2.0 to 6.5 g), accretion to bone (0.22 to 0.84 g), and dietary calcium absorption (0 to 68% of intake), with a decrease in fecal calcium excretion (765 to 254 mg/day). Phosphorus fecal excretion decreased (265 to 34 mg/day) and magnesium intake exceeded the combined urinary and fecal excretion both before and after vitamin D therapy although serum magnesium remained normal throughout the study.

3421 CHOLESTYRAMINE AND POLYSORBATE-80 IN THE TREATMENT OF CHOLERHEIC ENTEROPATHY: REPORT OF A CASE.

(E.) Shuster, F. (North Miami Beach, Fla.), R. C. Spoto and M. N. Jacobs. *Amer J Dig Dis* 15(4):353-358, 1970.

A case is presented of an 18-yr-old male patient who was treated with cholestyramine (4 g t.i.d., p.o.) and polysorbate-80 for diarrhea and mild transient steatorrhea following subtotal ileectomy. The diarrhea improved remarkably after cholestyramine, an ionic exchange resin sequesterer of inonized bile salts. Because it is nonionic, polysorbate-80 was not sequestered by cholestyramine, and could be administered concurrently. Improvement in fecal-fat excretion and triolein ^{131}I absorption was suggested even when polysorbate-80 was administered with cholestyramine, despite the tendency of cholestyramine to worsen these parameters. Together cholestyramine and polysorbate-80 may be useful in treating the diarrhea and steatorrhea of "cholerheic enteropathy".

3422 TUMORS OF THE SMALL INTESTINE.

(Fr.) Verhaege, M. (no affil), J. C. Laurent and A. Lequint. *Clinique* 65(662):71-76, 1970.

3423 INTERNAL HERNIA THROUGH THE MESENTERY OF A MECKEL'S DIVERTICULUM.

(E.) Dalinka, M. K. (Wilford Hall USAF Med. Ctr., Lackland AFB, Texas), J. F. Wunder and R. D. Wolfe. *Radiology* 95(1):39-40, 1970.

3424 CROHN'S DISEASE.

(Sw.) Rosenqvist, H. (Soder Hosp., Stockholm, Sweden). *Lakartidningen* 67(7):741-748, 1970.

3425 BIZARRE LEIOMYOBLASTOMA OF JEJUNUM WITH ALCOHOL-INDUCED PAIN. (*E.*) Cerda, J. J. (VA Hosp., Philadelphia, Pa.), P. P. Toskes and P. V. Skerrett. *Amer J Dig Dis* 15(2):121-126, 1970.

3426 JEJUNAL CARCINOMA AS THE SOURCE OF RECURRENT GASTROINTESTINAL HEMORRHAGE. (*E.*) Cave, R. H. (Naval Hosp., St. Albans, New York) and D. J. Doohen. *Milit Med* 135(3):218-220, 1970.

3427 GIANT MECKEL'S DIVERTICULUM IN A PREMATURE INFANT. (*E.*) Cross, V. F. (St. Peter's Hosp., Albany, N. Y.), A. J. Wendth, J. J. Phelan, H. G. Goussous and D. J. Moriarty. *Amer J Roentgen* 108(3):591-597, 1970.

3428 JEJUNOCOLOSTOMY FOR OBESITY. (*E.*) Wills, C. E., Jr. (Wills Mem. Hosp., Washington, Ga.). *Maryland Med J* 19(3):45-50, 1970.

3429 BOWEL HERNIATION THROUGH THE FORAMEN OF WINSLOW. (*E.*) Cook, J. L. (U. Louisville Sch. Med., Kentucky). *Amer Surg* 36(4):241-247, 1970.

3430 UNUSUAL COMPLICATIONS IN PATIENTS WITH MECKEL'S DIVERTICULUM: CASE REPORT. (*E.*) Hallbook, T. (U. Hosp., Lund, Sweden) and E. Lindstedt. *Acta Chir Scand* 136(1):77-80, 1970.

3431 TECHNIQUES OF SMALL BOWEL LOOP INVERSION. (*It.*) Grassi, G. (Hosp. United, Rome, Italy), E. Fivoli and C. Orecchia. *Chir Gastroent* 3(4):529-534, 1969.

3432 A CASE OF JEJUNAL ADENOCARCINOMA. (*It.*) Vota, L. (Civil Hosp. Genoa, Italy), G. Virdis and G. Barbaro. *Pathologica* 61(893-894):45-49, 1969.

3433 MAST-CELL BEHAVIOR IN CROSBY BIOPSY DUODENOJEJUNAL MUCOSA SPECIMENS IN MEGALOBLASTIC ANEMIA. (*It.*) Astaldi, G. (City Hosp., Tortona, Italy), J. Krc, V. Krcova, A. A. Astaldi Jr. and P. L. Taverna. *Minerva Med* 61(13):595-603, 1970.

- P:Secr:Int (3234)
- Diagproc (3278) (3290)
- D:Stomduo (3368)
- D:L.Intest (3469)
- D:L.Intest:Ulccol (3506)
- D:Gen (3707)

SMALL INTESTINE

Regional Enteritis

3434 A PSYCHOSOMATIC COMPARISON OF PATIENTS WITH ULCERATIVE COLITIS AND CROHN'S DISEASE. (*E.*) McKegney, F. P. (Yale U. Sch. Med., New Haven, Conn.), R. O. Gordon and S. M. Levine. *Psychosom Med* 32(2):153-166, 1970.

In Phase 1 of this study the charts of 83 patients with clearly established ulcerative colitis or Crohn's disease (drawn from all cases seen during the preceding 10 yr) were reviewed, and in Phase 2, the charts of a consecutive sampling of 35 outpatients and 5 inpatients with inflammatory bowel disease (21 with ulcerative colitis and 19 with Crohn's disease, representing all patients seen during a 2-month period) were reviewed. Investigation revealed a high incidence of emotional disturbances and life crises prior to the onset of illness in both diseases (e.g. in Phase 2 patients, a serious life crisis occurred during the 6-month period prior to the onset of disease in 86% of the ulcerative colitis patients and in 68% of the Crohn's disease patients). There were no significant differences between patients with the two diseases in a large number of demographic, psychosocial, personality, behavioral, psychiatric, and physical disease characteristics. In both syndromes, there was a highly positive correlation between the severity of emotional disturbance and the seriousness of the physical illness. The results of the study support the theory that similar personality and life event factors contribute to, and may be necessary for, the development and severity of ulcerative colitis and Crohn's disease. The study indicates the need for early identification and treatment of emotional disturbance in both groups of patients.

3435 SEVERE GROWTH RETARDATION IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE. *(E.)*

McCaffery, T. D. (Dept. Med. U. Chicago, Ill.), K. Nasr, A. M. Lawrence and J. B. Kirsner. *Pediatrics* 45(3):386-393, 1970.

The pathogenesis of severe growth retardation (defined as height below the third percentile) was investigated in 22 children with chronic inflammatory bowel disease (either ulcerative colitis or regional enteritis). Some children exhibited delayed secondary maturation (6), delayed epiphyseal closure (8), at least 1 relative with the bowel disease (9) or another disease (19), personality disorders (11), and varying dietary problems (all 22), including steatorrhea, hypoalbuminemia, anorexia and vomiting. Only 2 out of 20 children showed a percentile growth increment during steroid treatment, while 18 increased slightly in height, and the success noted with intestinal resection could be a result of this steroid treatment or a delayed onset of pubertal growth spurt. Spontaneous growth occurred in only 1 child and androgen therapy in this child brought on secondary sexual maturation without any growth acceleration.

3436 GENETIC TENDENCY IN CROHN'S DISEASE. *(E.)*

Hislop, I. G. (Queen Elizabeth Hosp., Woodville, Australia) and A. K. Grant. *Gut* 10(12): 994-995, 1969.

Remarkable similarity occurred in the course of Crohn's disease in a 27 year old housewife and her monozygotic twin (also a housewife). The difference in time between diagnoses was only 11 months and there was close parallelism in the site, extent, and progress of the disease, although only 1 twin required bowel (terminal ileum) resection. This represents the fifth reported instance of Crohn's disease in identical twins, and, considered together, a multigene focus or possibly a genetic predisposition requiring an environmental factor for its clinical expression may be involved.

- D:Stomduo (3364)
- D:S.Intest (3418)
- D:L.Intest (3462) (3477)
- D:L.Intest:Ulccol (3507)

SMALL INTESTINE

Malabsorption

3437 RESPONSE OF THE JEJUNAL MUCOSA IN ADULT CELIAC DISEASE TO ORAL PREDNISOLONE. *(E.)*

Wall, A. J. (Roy. Postgrad. Med. Sch., London, England), A. P. Douglas, C. C. Booth and A. G. E. Pearse. *Gut* 11(1):7-14, 1970.

Histologic, microscopic, histochemical and biochemical changes in the jejunal mucosa in response to treatment with prednisolone (10g p.o. q.i.d. for 4-5 weeks) and a normal diet were studied in 5 patients with adult celiac disease. Cell height improved in all patients, normal cell height (729.3 μ) was reached by 1 patient, and lymphoid infiltrate became less intense in all patients during prednisolone treatment. Within 4 weeks after withdrawal of prednisolone, cell height decreased (but not to pretreatment levels) and lymphoid infiltrate increased. Before treatment, microvilli of surface cells were blunted, fused and reduced in number, mitochondria were swollen and lacking in cristae, and cell nuclei were irregular in shape and position. During prednisolone treatment partial or complete recovery of the microvilli, mitochondria and cell nuclei occurred but following withdrawal of prednisolone, surface cells reverted to their pretreatment appearance. Prednisolone treatment increased the brush border activity of alkaline phosphatase, non-specific esterase, monoamine oxidase and lysosomal acid phosphatase but following prednisolone withdrawal the activities of these enzymes reverted to pretreatment levels. Prednisolone improved the ability of the jejunal mucosa to digest a gluten peptide solution (as measured by release of proline and glutamic acid) and this improvement reverted to pretreatment level following prednisolone withdrawal. Xylose absorption improved and fecal fat and nitrogen excretion decreased in 4 patients during prednisolone treatment (steatorrhea remitted completely in 1 patient). In 1 patient, prednisolone withdrawal was followed by severe relapse with weight loss, diarrhea and increased steatorrhea.

3438 THE ABSORPTION OF α-TOCOPHEROL IN CONTROL SUBJECTS AND IN PATIENTS WITH INTESTINAL MALABSORPTION. *(E.)*

MacMahon, M. T. (Roy. Postgrad. Med. Sch., London, England) and G. Neale. *Clin Sci* 38(2):197-210, 1970.

Absorption of p.o. doses of 12 and 25 μC of tritiated DL-α-tocopherol was studied in seven control subjects and 23 patients with malabsorption (celiac disease, tropical sprue, lymphangiectasia, gastrectomy, pancreatic insufficiency, common bile duct obstruction) by measuring radioactivity in plasma, feces and urine. Radioactivity first appeared in the plasma of control subjects between 1 and 3 hr after the α-tocopherol adminstration and was maximal between 3 and 9 hr (thereafter declining exponentially), with a mean half-life of 53 hr. Net absorption of tritiated α-tocopherol (calculated by assuming that administered radioactivity not recovered from the feces excreted in 6 days had been absorbed) was 68.6% of the oral dose in control subjects. A mean of 8.2% of the oral dose of α-tocopherol was recovered from the urine within 3 days in control subjects. Radioactivity in plasma of control subjects was almost entirely associated with free α-tocopherol. Net absorption of tritiated α-tocopherol was 11.2% of the oral dose in patients with pancreatic and biliary disease, 29.5% in patients with lymphangiectasia, 42.6% in patients with celiac disease or tropical sprue, and 54.6% in patients with gastrectomy. Mean urinary excretion of radioactivity (% of oral dose) was 0.5 to 4.5% in patients with pancreatic and biliary disease, 4.5% in patients with celiac disease or tropical sprue, 1.8% in patients with lymphangiectasia, and 11.4% in patients with gastrectomy. Malabsorption of tritiated α-tocopherol in patients with celiac disease or tropical sprue was correlated with the degree of steatorrhea and malabsorption of tritiated α-tocopherol was more severe than that of fat in patients with intestinal lymphangiectasia.

3439 RENAL AND INTESTINAL HEXOSE TRANSPORT IN FAMILIAL GLUCOSE-GALACTOSE MALABSORPTION.

(E.) Elsas, L. J. (Yale U. Sch. Med., New Haven, Conn.), R. E. Hillman, J. H. Patterson, and L. E. Rosenberg. *J Clin Invest* 49(3):576-585, 1970.

In vitro transport (uptake, efflux) of D-glucose-^{14}C by biopsy specimens of jejunal mucosa and *in vivo* transport of glucose (titration techniques) by the kidney were studied (by Michaelis-Meutin analysis) in a 3-yr-old girl with congenital glucose-galactose malabsorption, in 4 members of her family, and in 16 normal volunteers. Uptake of D-glucose by normal jejunal mucosa increased with time and was concentrated to levels 14.4 and 17.5 times greater than that in the incubation medium at 30 and 60 min, resp. Accumulation of D-glucose by normal jejunal mucosa was inhibited when incubation was carried out in the absence of sodium ion or in the presence of ouabain, sodium cyanide, 2,4-dinitrophenol and D-galactose. There was no accumulation of D-glucose by the jejunal mucosa of the patient with congenital glucose-galactose malabsorption during a 60-min incubation period and the jejunal mucosa of both of her parents and a half-sister accumulated D-glucose at values intermediate between her own and those of her normal brother. When jejunal mucosa was preincubated with radioactive D-glucose-^{14}C for 30 min and transferred to an isotope-free medium, there was a progressive increase in radioactivity in the medium and the amount of radioactivity remaining in the tissue decreased with increasing time (no difference was observed between biopsy specimens from normal subjects and patient-family heterozygotes). Renal inulin clearance and glucose reabsorption were 78 ml/min and 187 mg/min, resp., in the patient and 123 ml/min and 291 mg/min, resp., in normal subjects. Familial glucose-galactose malabsorption apparently is an inherited autosomal recessive trait and heterozygotes for this trait demonstrate a reduced capacity for glucose transport accompanied by a partially impaired renal glucose transport.

3440 NUCLEIC ACID CONTENT OF THE INTESTINAL MUCOSA IN KWASHIORKOR.

(E.) Konno, T. (Dept. Child Hlth. Med., U. Cape Town, South Africa), D. Becker and J. D. L. Hansen. *S Afr Med J* 43(50):1527-1528, 1969.

The content of RNA, DNA and protein was determined by ultraviolet absorption and optical density analyses of small intestine biopsy specimens taken from 6 children (age 9 to 27 months) with Kwashiorkor during hospital admission and subsequent recovery. There was no significant difference in the amount of DNA, RNA and protein found in the intestinal mucosa during hospital admission and subsequent recovery from Kwashiorkor. The cell composition of the intestinal mucosa (unlike the liver) apparently is not altered in Kwashiorkor.

3441 PEPTIDE HYDROLASE ACTIVITY OF HUMAN INTESTINAL MUCOSA IN ADULT CELIAC DISEASE.

(E.) Douglas, A. P. (Roy. Postgrad. Med. Sch., London) and T. J. Peters. *Gut* 11(1):15-17, 1970.

The levels of 2 peptide hydrolases were studied in the intestinal mucosa form normal subjects, patients with untreated celiac disease, and treated (prednisolone, 40 mg/day for 21 to 35 days; p.o. or gluten withdrawal) patients. The mucosa from the untreated patients had significantly reduced activity against glycyl-glycine and leucyl-leucine but no such difference was found for the treated patients. There was a rise in intestinal peptide hydrolase during successful treatment with gluten withdrawal or prednisolone. The reduction in peptidase activity in untreated celiac disease was secondary to the mucosal damage.

3442 A FEW ENZYMATIC AND IMMUNOLOGIC RESEARCHES IN CHILDREN WITH CELIAC DISEASE AND OTHER CHRONIC ENTEROPATHIES AND WITH IMMUNOLOGIC DEFICIENCIES.

(E.) Nordip, S. (Hosp. Burlo Garofalo, Trieste, Italy), G. Cordone, R. Gatti, A. G. Marchi, P. Moscatelli and P. Vignola. *Helvetia Acta Pediat* 25(1):62-76, 1970.

Metabolic and immunologic studies in children with celiac diseases and other chronic enteropathies with immunologic deficiencies were separately conducted as follows: 1) enzyme activity of intestine; 2) IgG production and secretion in intestinal mucosa; 3) phytohemoagglutinin (PHA) responsivity of *in vitro* cultured peripheral-blood lymphocytes. There was a statistically significant increase of lysosome β-glucuronidase of intestine in gluten-intolerance and other chronic enteropathies and enzyme activity was significantly decreased in several diseases with immunologic deficiency. IgG hyperproduction occurred in patients with gluten-intolerance and other chronic enteropathies. There was no relation between blast-transformation and β-glycuronidase increase in PHA-stimulated lymphocytes and PHA-hyposensitivity of lymphocytes (chiefly demonstrated by non-increase of β-glycuronidase) was observed in several cases of gluten-intolerance and diseases of immunologic deficiency. Immune reactivity, in most cases of gluten-intolerance and other chronic enteropathies, evaluated by study of lymphocyte PHA-activity, was not impaired (this reactivity is seemingly increased in the malabsorption syndrome).

3443 AN EVALUATION OF A TEST USING ^{14}C-LABELED TRIGLYCERIDE IN THE DIAGNOSIS OF STEATORRHEA. *(E.)* Bhatia, S. K. (Roy. Victoria Hosp., Belfast, Ireland), T. K. Bell, A. H. G. Love and D. A. D. Montgomery. *Irish J Med Sci* 2(11):545-552, 1969.

The diagnostic value of intestinal absorption of ^{14}C-labeled triglycerides (5μC in 1 g fat/kg p.o.) (determined by measuring exhaled $^{14}CO_2$) was compared with the standard fecal fat excretion test in 56 patients (with steatorrhea, obesity, uncontrolled thyrotoxicosis, or after gastrointestinal surgery) and healthy controls. Since a majority of the patients (76.7%) had the highest $^{14}CO_2$ concentrations between 5 and 7 hr after receiving the labeled triglycerides, determining the $^{14}CO_2$ levels (in %mm) during this interval and referring to fecal fat estimations has provided a method to distinguish between patients with steatorrhea ($^{14}CO_2$ levels below 25%mm), those suspect of steatorrhea ($^{14}CO_2$ levels between 25 and 30%mm) and healthy controls ($^{14}CO_2$ levels above 30%mm). The new technique also parallels fecal fat excretion in patients with previous gastrointestinal operations but is unreliable in the presence of uncontrolled thyrotoxicosis or obesity.

3444 A SIMPLE JEJUNOCOLIC "VALVE" FOR RELIEF OF RAPID TRANSIT AND THE SHORT BOWEL SYNDROME. *(E.)* Waddell, W. R. (U. Colorado Med. Ctr., Denver), F. Kern, Jr., C. G. Halgrimson and J. J. Woodbury. *Arch Surg* 100(4):438-444, 1970.

A method of making valves at the site of the jejunocolic anastomoses is described, in which the procedure essentially amounts to creation of a short segment of reverse intussusception. In 3 cases in which the procedure was performed, 2 benefitted from the surgery but the third was obstructed by the valve which was placed 31 cm from the ligament of Treitz. In the first 2 cases following surgery, assessments of absorption and nutrition showed that both were unable to absorb vitamin B_{12}. Electrolyte and water balance were normal in both but one case did require magnesium supplementation and his magnesium level was barely normal. Sugar and carbohydrate absorption were severely impaired in both patients which was felt to be due to the absence of ileum and large portions of jejunum. Fat absorption postoperatively was 20 and 50 gm/day, resp. in the 2 patients. A weight gain of 6.8 kg was achieved in one patient who, however, remains underweight and lacks stamina and is following a sedentary life. The second patient gained 13.2 kg, has achieved an ideal weight and leads a normal life.

3445 IMMUNOGLOBULINS IN TROPICAL SPRUE. *(E.)* Samuel, A. M. (Tata Mem. Hosp., Parel, Bombay, India), B. Singh and S. Jarnum. *Scand J Gastroent* 5(2):129-134, 1970.

Serum levels of the immunoglobulins G, M, and A (g/l determined by the radial diffusion method of Mancini, Vaerman, Carbonara and Heremans) and immunoglobulin-G turnover (by measuring ^{125}I labeled immunoglobulin in blood, urine and feces after 20 μC i.v.) were compared in Danish, British and Indian controls and in patients with tropical sprue. Indian control levels of immunoglobulin-G and -M (13.2 and 1.5 resp.) are significantly higher than for the Danish (10.8 and 0.67) and British (9.5 and 0.94) controls but their immunoglobulin-A values (1.8, 1.86, and 2.48 resp.) are similar. Of the 28 sprue patients studied, some had low, normal, and high levels of immunoglobulin-G (1, 23, and 4 resp.) and of immunoglobulin-M (12, 11, and 5 resp.); 2 patients had no immunoglobulin-A while 17 had normal and 9 had high levels. The mean fractional catabolic rate (% intravascular pool/day) for immunoglobulin-G in controls was 6.1 while in sprue patients 7 were above normal, 3 were below normal, 18 were normal, and the mean synthetic rate (mg/kg/day) for Indian controls was 76, while in sprue patients 2 were high, 4 were low and the remaining were normal.

3446 GASTROINTESTINAL DYSFUNCTION IN DERMATITIS HERPETIFORMIS. *(E.)* Berg, N. O. (U. Hosp. Lund, Sweden), A. Dahlqvist, T. Lindberg, T. Mansson, A. Norden and H. Rorsman. *Acta Dermatovener* 50(1):42-48, 1970.

Nine patients (8 male and 1 female, aged 25 to 73 yr) who had had dermatitis herpetiformis (difficult to control, or with anemia) for 8 to 28 yr, were studied for intestinal dysfunction. All patients showed signs of hemolysis and a normal Schilling test. Peroral biopsy of small-intestinal mucosa revealed "disappearance" of villi in 6 patients. Disaccharidase activities of the mucosa were abnormal in 5 of 8 patients and dipeptidase activities were abnormal in 6. When one patient had been on a gluten-free diet for 4 months the changes in the intestinal mucosa showed distinct regression with single plump, leaf-shaped villi but still abundant cellular infiltration. All 5 disaccharidases were normalized. After the patient had been on the gluten-free diet for 9 months the histological changes had regressed even more. The dipeptidase activities were, however, still significantly decreased. The patient's skin symptoms were not affected by the diet and still required sulfone treatment as before. In the group of 8 patients studied, only 2 (both of whom had undergone gastric resection) were completely normal.

3447 PROTEIN-LOSING ENTEROPATHY IN DERMATITIS HERPETIFORMIS. *(E.)* Gjone, E. (U. Hosp., Oslo, Norway) and A. Oyri. *Scand J Gastroent* 5(1):13-15, 1970.

The clinical states of 2 patients with dermatitis herpetiformis and protein-losing enteropathy but

hout fat or carbohydrate malabsorption are exam-
d. Both patients had normal fat absorption as
wn by the vitamin A absorption test (higher than
I.U./100 ml in plasma), carbohydrate absorption
shown by the d-xylose test (more than 4.5 g/5 hr
urine), and one had normal fecal excretion (less
n 8 g/day) while the other had a high value (12.5
lay). Both had low total serum protein levels
5 and 5.2 g/100 ml), albumin fractions (2.1 and
g/100 ml), and increased intestinal protein ex-
tion (more than 1.2%). Intestinal biopsy with
sby's capsule indicated flat jejunal mucosa in
e and leaf-shaped villi with intervillous bridging
the other.

48 DIGESTION OF GLUTEN PEPTIDES BY NORMAL HUMAN JEJUNAL MUCOSA AND MUCOSA FROM
TIENTS WITH ADULT CELIAC DISEASE. *(E.)* Douglas,
P. (Roy. Postgrad. Med. Sch., London, England)
d C. C. Booth. *Clin Sci* 38(1):11-25, 1970.

tivity of peptidases concerned in the hydrolysis
a peptic-tryptic digest of gluten in mucosa from
patients with untreated adult celiac disease
ose jejunal biopsies showed subtotal villous
rophy (9 of them studied also after a gluten-
ee diet), and 9 other patients with adult celiac
sease but normal intestinal mucosa who had been
gluten-free diet for a yr or more was compared
th that of 32 histologically normal specimens
jejunal mucosa from subjects without malabsorp-
ve disease. The ability of the jejunal mucosa
om the patients with untreated adult celiac
isease to liberate amino acids from the gluten
eptides was significantly less than that of the
icosa from control subjects; with no difference
rom normal in mucosa from treated adult celiac
isease patients regardless of histological con-
ition. The impairment of jejunal mucosal di-
estion of gluten in untreated adult celiac disease
eemingly is a secondary phenomenon and celiac
isease seemingly is not due to the absence from
he intestinal mucosa of an enzyme normally con-
erned in the digestion of gluten.

3449 METABOLIC AND HISTOCHEMICAL CHANGES AFTER SMALL-BOWEL RESECTION IN THE DOG. *(E.)*
apnick, S. (Roy. Postgrad. Med. Sch., London,
England), J. Landor, L. DeFrietas, U. Welsch and
. G. Cox. *Brit J Surg* 56(12):899-903, 1969.

Metabolic and histochemical changes were studied in 16 dogs with 75% proximal or distal excision of small intestine (as a single- or multiple-stage procedure). Dogs with distal resections of the small intestine lost more weight than those with proximal resections (not statistically significant) and weight-loss was statistically (P < .001) more severe in animals with 75% small intestine resection in multiple stages than in those with a similar length of small intestine resected in one stage. Calorie balance studies showed some increased loss while nitrogen balance exhibited little change following resection. In the 3-stage operation (proximal resection), there was no change in fecal fat excretion after 25% resection (3.8 ± .84% fecal content), a small but insignificant increase after 50% resection (11.1 ± 10.74% fecal content), and a significant increase after 75% resection (21.2 ± 15.20% fecal content); control response before resection was 3.8 ± 2.15%. In distal resection groups there were significant and more marked increases in fecal fat at each stage (control response 4.8 ± 0.99% fecal content; 25% resection, 10.0 ± 2.85%; 50% resection, 22.4 ± 10.53%; 75% resection, 42.6 ± 16.48%). In the one-stage operation, mean % rise in fecal fat excretion above the prepoperative value after distal resection (731 ± 417) was significantly greater than mean % rise after proximal resection (235 ± 130). Fecal fat excretion expressed as percentage of fat intake was more severe after 75% resection in 3-stages than in one stage. In dogs with distal resection, the fecal fat value after 75% resection in 3-stages was significantly greater than in one stage while in dogs with proximal resections, fecal fat value after 75% resection in 3-stages was greater than after 75% resection in one stage (not significant). Mean fecal fat value in all 8 dogs after resection of distal 75% of the small intestine (31.9 ± 18.6%) was significantly greater than in all 8 dogs after resection of the proximal part of 75% of the small intestine (12 ± 4.9%). Acetylcholinesterase, normally absent or present in minimal amounts in epithelial cells, was increased after proximal resection but not after distal resection of the small intestine in all dogs. The high concentration of acetylcholinesterase found in ileum after jejunal resection seemingly may explain the mechanism whereby fecal fat excretion was lower after proximal rather than distal resection.

3450 TRIGLYCERIDES WITH MEDIUM-LENGTH CHAINS: A NEW TREATMENT IN THE MALABSORPTION OF LIPIDS. *(Fr.)* Guy-Grand, B. (no affil) and H. Bour. *Rev Prat* 20(6):829-847, 1970.

3451 THE BILE LIPIDS AND FATTY ACIDS IN NUTRITIONAL FAT DEFICIENCY. *(Rus.)* Pomerantseva, I. I. (Acad. Med. Nauk, Moscow, USSR), M. M. Levachev and G. K. Shlygin. *Vop Pitan* 28(6):36-40, 1969.

3452 MESENTERIAL BOWEL ABSORPTION IN OBSTRUCTED ALIMENTARY TRANSIT WITH SPECIAL REFERENCE TO THE BLIND LOOP SYNDROME. *(It.)* Zanella, L. (Inst. Clin. Surg. Surg. Ther., U. Bologna, Italy), and F. Farruggia. *Ateneo Parmense* 39(supp. 6):273-287, 1968.

3453 GLUCOSE-GALACTOSE MALABSORPTION: STUDIES ON RENAL GLUCOSURIA. *(E.)* Meeuwisse, G. W. (Dept. Pediat. U. Lund, Sweden). *Helvetia Pediat Acta* 25(1):13-24, 1970.

3454 NORMAL SERUM AND RED-CELL FOLATE LEVELS IN A CHILD WITH CELIAC DISEASE. *(E.)* Cook, D. M. (West Middlesex Hosp., Isleworth, England), N. Evans, A. Lloyd and J. S. Stewart. *Lancet* 1(7646):571-572, 1970.

3455 PREVALENCE OF LACTOSE MALABSORPTION IN A FINNISH RURAL POPULATION. (*E.*) Jussila, J. (Child. Hosp., U. Helsinki, Finland), M. Isokoski and K. Launiala. *Scand J Gastroent* 5(1):49-56, 1970.

3456 EXTERNAL PROGRESSIVE OPTHALMOPLEGIA ASSOCIATED WITH SENSORY MOTOR NERVE DEGENERATION IN A PATIENT WITH CELIAC DISEASE. (*Fr.*) Telerman-Toppet, N. (Brugmann Hosp., Free U. Brussels, Belgium), C. Coers and J. J. Desneux. *Rev Neurol* 121(1):57-70, 1969.

3457 MALABSORPTION AND JEJUNAL DIVERTICULOSIS. (*Nor.*) Lind, I. (Med. Clin. Gavle, Sweden). *Nord Med* 83(10):303-306, 1970.

3458 CARBOHYDRATE MALABSORPTION DUE TO ENZYMIC DEFECTS. (*Nor.*) Skrede, S. (Inst. Clin. Biochem., U. Oslo, Norway). *T Norsk Laegeforen* 90(2B):245-248, 1970.

- P:Morph (3036)
- Diagproc (3267) (3305)
- D:Stomduo (3343)
- D:Gen:Parasit (3786)

LARGE INTESTINE

3459 PRESSURE ACTIVITY OF THE COLON AND RECTUM IN DIVERTICULAR DISEASE BEFORE AND AFTER SIGMOID MYOTOMY. (*E.*) Attisha, R. P. (Western Gen. Hosp., Edinburgh, Scotland) and A. N. Smith. *Brit J Surg* 56(12):891-894, 1970.

Intraluminal pressure of the colon and rectum was determined in 29 untreated patients with diverticular disease, 14 patients with sigmoid myotomy (1-6 months after surgery), and 9 normal subjects. There was no significant difference in basal pressure activity (recorded as mean motility index) in the three groups tested (normals, 151; diverticular disease, 343; after sigmoid myotomy, 130). There was an increase of the motor activity of the bowel following ingestion of a meal in all groups and patients with diverticular disease (740) responded more than controls (263). Prostigmine increased both amplitude and frequency with a resulting increase in motility index, both for normals and groups with diverticular disease (normals, mean index, 791; diverticular disease, 2856; after sigmoid myotomy, 1183). Wave amplitudes increased after food and prostigmine, while after myotomy, marked decrease in number of waves occurred. Atropine (0.4-0.6 mg) given to patients under treatment with prostigmine caused a decrease in mean motility index from 2852 to 1400. (In subjects already myotomized, the decrease was from 1260 to 200). Propantheline bromide (3.5 mg) virtually abolished all prostigmine effects in diverticular disease group, before and after surgery. There seemingly is some residual smooth-muscle activity (however weakly present) in the colon or at zones close to myotomy site.

3460 COLONIC ILEUS. (*E.*) Decker, G. A. G. (Johannesburg Hosp., Union of South Africa) and A. D. Smith. *S Afr J Surg* 7(4):143-147, 1969.

The clinical evaluation, subsequent management, and progress of 11 patients with colonic ileus is presented. The radiological picture was that of large bowel distension, but none of the symptoms or signs were diagnostic. It is suggested that a barium enema be done on admission to confirm the presence of organic stenosis before laparotomy. Although the mechanism of colonic ileus is obscure, the possibility of a spastic segment causing a dilatation of the colon is ruled out in the three patients on whom laparotomies were performed. The 8 patients not operated on responded to intravenous fluids and nasogastric suction.

3461 APPENDICITIS ASSOCIATED WITH *SHIGELLA SONNEI* INFECTION. (*E.*) Phillips, T. J. (no affil). *Alaska Med* 11(2):74-76, 1969.

An association between *Shigella sonnei* dysentery and acute appendicitis in two cases which occurred during a recent outbreak of dysentery caused by infection with *Shigella sonnei* is presented. At the time of surgery for case 1, it was felt that the primary problem was *Shigella* dysentery which presented symptoms mimicking appendicitis, and the minimal signs of inflammation reported after biopsy tended to confirm this impression. In the second case, however, actual perforation of the appendix occurred in a child who had received partial treatment for proven *Shigella* dysentery.

52 CUTANEOUS ULCERATION IN CROHN'S DISEASE.
(*E.*) Mountain, J. C. (Roy. Victoria Hosp.,
rnemouth, England). *Gut* 11(1):18-26, 1970.

ven cases of extensive perineal ulceration (4 of em with cutaneous ulceration elsewhere also) were en in 207 cases of Crohn's disease. Perineal ul- ration was the most common site, and in all of ese patients (4 male, ages 32 - 66; 3 female, ages - 69) it was the initial site. Parastomal ulcera- on was present in 2 patients and metastatic in 3. roscopically, the ulceration was characterized florid granulation tissue with marked destruction the surrounding tissues. The skin edge was edem- ous and there was a typical dusky cyanosis of the rrounding skin. Though the ulceration is usually sociated with severe Crohn's disease of the strointestinal tract the condition has to be fferentiated from tuberculosis by demonstrating the pical sarcoid granulomatous reaction in the absence central caseation in a biopsy of the ulceration, gether with a normal chest radiograph and a nega- ve Mantoux test to a dilution 1 in 100. The first age in treatment is usually the removal of the jacent bowel if it is involved in the disease as e ulceration will never heal when the bowel is ill present no matter what local treatment is em- oyed. Treatment including oral zinc sulfate and peated curettage is recommended.

63 ABSORPTION AND SECRETION OF WATER AND ELECTROLYTES BY THE INTACT HUMAN COLON IN FFUSE UNTREATED PROCTOCOLITIS.
(*E.*) Harris, J.
J. Coll. Hosp., London, England) and R. Shields.
ut 11(1):27-33, 1970.

e colonic absorption of sodium, potassium, and ater in 4 patients with diffuse untreated proctoco- itis (ages 27 - 69 yr, 3 of them male with proctoco- itis involving the entire colon) was compared with hat of 13 healthy male medical students (ages 19 - 3 yr). The colon was perfused with an isotopically- abeled solution instilled through a tube intro- uced by mouth. In the 4 patients, the mean rate f absorption of sodium was reduced to 1/3, and of ater to 1/7; while potassium was secreted into the olonic lumen at a mean rate of more than 4 times hat found in the healthy subjects. Sodium and otassium ions moved more rapidly into the lumen of he ulcerated colon and the rate of movement of odium out of the colonic lumen was diminished. In atients and healthy subjects alike, the net trans- ort of water was closely correlated with that of odium. The diarrhea of proctocolitis can be ex- lained in part at least by the impairment of the colon in its ability to absorb the salt and water delivered to it from the ileum and by an increase in the secretory function and a decrease in the ab- sorptive function of the diseased colon.

3464 AN *IN VITRO* SYSTEM FOR STUDYING MUCUS SECRETION AND OTHER PHYSIOLOGICAL ACTIVITIES IN HUMAN INTESTINAL MUCOSA.
(*E.*) Johansen, P. G.
(Roy. Child. Hosp. Res. Found., Melbourne, Australia).
Experientia 26(2) 130-131, 1970.

Human rectal mucosa was obtained by suction biopsy from patients with cystic fibrosis for *in vitro* studies on the excessively viscous mucous secretions and the electrolyte abnormalities in the serous secretions. Trowell's technique was the most satisfactory culture method, using a media based on 199 or Trowell's T8, containing 4 mg/ml glucose, and usually 10% fetal calf serum. Antibiotics were added to the culture medium, and various additives such as insulin and hydrocortisone were tested and the criterion for satisfactory survival was based on histological examination. Biopsies from 40 patients with cystic fibrosis and from normal controls were compared in this study using histochemical methods and autoradiography for examining mucous production. No consistent histologic or chemical differences were demonstrated.

3465 ISCHEMIA AND GANGRENE OF THE COLON FOLLOWING ABDOMINAL AORTIC RESECTION.
(*E.*) McBurney, R. P. (U. Tennessee Med. Sch., Memphis), H. Howard, R. O. Bicks and G. F. Bale.
Amer Surg 36(4):205-209, 1970.

The records of 20 patients who suffered from ischemia and gangrene of the colon after they had undergone abdominal aortic resection were examined to determine the etiology of and treatment for these complications. Interruption of the arterial blood supply to the left colon results in ischemia and diarrhea, unexplained toxicity, or hypotension that occurs postoperatively suggests ischemia and immediate treatment (usually colectomy if gangrene is present) is advised. Prophylactic measures include avoiding trauma to the collateral circulation of the colon, implanting the inferior mesenteric artery into the wall of the graft, or insuring patency of the internal iliac vessels.

3466 PERFORATION OF THE COLON AFTER EXCHANGE TRANSFUSION IN THE NEWBORN.
(*E.*) Friedman, A. B. (Mt. Sinai Hosp., Cleveland, Ohio), R. M. Abellera, I. Lidsky and M. Lubert. *New Eng J Med* 282(14):796-797, 1970.

Perforation of the anterior wall of the ascending colon (at its midpoint) as a complication of exchange transfusion is described in a female infant born at 36 weeks gestation. Abdominal distention, vomiting of bile-stained mucus, and passage of normal meconium stool were the earliest findings and abdominal radiographs suggested the presence of intramural gas in the gut and necrotizing enterocolitis. Repeat abdominal radiographs revealed pneumoperitoneum and the previous diagnosis (of necrotizing enterocolitis) with perforation was confirmed. Following exploration of the abdomen (revealed murky fluid and meconium, necrotic ascending colon with midpoint perforation), an uneventful right hemicolectomy was performed. The pathological specimen (ascending colon, appendix, and a portion of the terminal ileum) was characterized by a necrotic oval perforation of the antimesenteric border of the colon and the surrounding mucosa was edematous, ulcerated, necrotic and covered by bile-stained exudate. Authors believe this to be the first case in the American literature that was diagnosed correctly before operation and successfully treated by surgery.

3467 ANAL DISORDERS IN DIABETES. *(Fr.)* Schrub, J. Cl. (Rouen, France), B. Hillemand and Y. Clabaut. *Sem Hop* 45(50):3189-3190, 1969.

3468 MORPHOLOGIC ABNORMALITIES OF THE SUBMESOCOLIC DIGESTIVE TRACT IN DIABETICS: ATONIA AND DILATATION OF THE COLON—GASTRIC SECRETORY DEFICIENCY ATONIA AND COLONIC DILATION. *(Fr.)* Schrub, J. Cl. (Rouen, France), B. Hillemand and Y. Clabaut. *Sem Hop* 45(50):3184-3188, 1969.

3469 CHANGES IN THE DUODENAL LOOP SECONDARY TO CARCINOMA OF THE HEPATIC FLEXURE OF THE COLON. *(E.)* Treitel, H. (New York Med. Coll. Metro. Hosp. Ctr., New York), M. A. Meyers and V. Maza. *Brit J Radiol* 43(507):209-213, 1970.

3470 SIGMOID VOLVULUS IN CHILDREN. (*E.*) Hunter, J. G. (U. Virginia Sch. Med., Charlottesville) and T. E. Keats. *Amer J Roentgen* 108(3):621-623, 1970.

3471 VILLOUS ADENOCARCINOMA OF THE RECTUM WITH SEVERE ELECTROLYTE DERANGEMENT. (*E.*) Ariaratnam, T. (St. Laurence's Hosp., Dublin, Ireland), A. P. Clery and M. Abrahamson. *J Irish Med Ass* 63(392):43-45, 1970.

3472 SURGICAL MANAGEMENT OF MULTIPLE POLYPOSIS: THE PROBLEM OF CANCER IN THE RETAINED BOWEL SEGMENT. (*E.*) Moertel, C. G. (Mayo Clin., Rochester, Minn.), J. R. Hill and M. A. Adson. *Arch Surg* 100(4):521-526, 1970.

3473 APPENDICITIS AND FEMALE STERILITY. (*Bul.*) Tokin, R. (Med. Inst. Sofia, Bulgaria) and Z. Vasilev. *Akush Ginek* 8(5):426-430, 1969.

3474 PRIMARY CANCER OF THE DIGESTIVE TRACT: CANCER OF THE LARGE INTESTINE. (*Sp.*) Zuniga, S. R. (Hosp. Gen. Tegucigalpa, Honduras). *Rev Med Hondurena* 36(3):197-224, 1969.

3475 PROGNOSIS AFTER SURGICAL TREATMENT OF CANCER OF THE RIGHT SIDE OF THE COLON. (*Nor.*) Neilsen, J. (Community Hosp., Copenhagen, Denmark), I. Balslev and H. E. Jensen. *Nord Med* 82(48):1501-1505, 1969.

3476 BACTERIOLOGY OF INFANTILE DIARRHEA: OBSERVATIONS OVER TWO YEARS IN THE DAKAR HOSPITAL SERVICE. (*Fr.*) Le Noc, P. (no affil) and H. Plassart. *Bull Soc Path Exot* 62(3):460-468, 1969.

3477 CROHN'S DISEASE OF THE COLON: II. TWO CASES OF PARADOXICAL CROHN'S DISEASE STARTING IN THE ANUS OR RECTUM: ACUTE SPREAD TO THE COLON FOLLOWING MANIPULATION AND LATER TO THE ILEUM. (*Fr.*) Parturier-Albot, M. (Paris, France), Cl. Olivier, B. Crespon and G. Albot. *Sem Hop Paris* 45(52):3296-3303, 1969.

3478 VOLVULUS OF THE SIGMOID COLON. (*E.*) Gupta S. (Coll. Med. Sci., Banaras Hindu U., Varanasi, India) and M. P. Vaidya. *Indian J Surg* 31(6):596-602, 1969.

3479 MASSIVE MEGACOLON AND MEGAILEUM IN CHILDHOOD DUE TO TUBERCULOUS STENOSIS OF THE ASCENDING COLON. (*E.*) Patton, J. J. (U. California, Los Angeles—Harbor Gen. Hosp., Torrance) and T. C. Moore. *Surgery* 67(3):513-518, 1970.

3480 CONDITIONS ASSOCIATED WITH CONGENITAL MEGACOLON. (*E.*) Kilcoyne, R. F. (Child. Hosp. Med. Ctr., North California, Oakland) and H. Taybi. *Amer J Roentgen* 108(3):615-620, 1970.

3481 THREE CASES OF ECTOPIC ANI. (*It.*) Ruozi-Beretta, L. (Clin. Obstet. Gynec. U. Bari) and N. Miccolis. *Minerva Ginec* 21(23):1638-1643, 1969.

3482 CLINICAL AND MANOMETRIC RESULTS ONE YEAR AFTER SIGMOID MYOTOMY FOR DIVERTICULAR DISEASE. (*E.*) Smith, A. N. (Western Gen. Hosp., Edinburgh, Scotland), R. P. Attisha and T. Balfour. *Brit J Surg* 56(12):895-899, 1969.

3483 CANCER OF THE CECUM: REVIEW OF 139 CASES. (*E.*) Foti, C. E. (Louisiana St. U. Sch. Med., New Orleans) and I. Cohn, Jr. *Amer Surg* 36(3): 129-135, 1970.

3484 THE TREATMENT OF CHRONIC FISSURE-IN-ANO: A TRIAL OF METHODS. (*E.*) Hawley, P. R. (U. California Med. Ctr., San Francisco). *Brit J Surg* 56(12):915-918, 1970.

3485 CECAL CARCINOMA CAUSING ACUTE APPENDICITIS: CASE IN A YOUNG WOMAN. (*E.*) Reece, R. L. (Minneapolis, Minn.). *Minnesota Med* 53(2):127-130, 1970.

3486 GARDNER'S SYNDROME: REPORT OF A FAMILY. (*E.*) Liedberg, G. (Dept. Surg., U. Lund, Sweden), K. Lindholm, E. Lindstedt and G. Lindstedt. *Acta Chir Scand* 136(1):81-84, 1970.

3487 APPENDICITIS IN INFANCY. (*E.*) Sembiring, L. (Med. Sch. U. North Sumatra, Medan, Indonesia), J. K. Tjaij and S. Sosroamidjojo. *Paediat Indonesia* 9(5):231-234, 1969.

488 A NEW OUTBREAK OF INFANTILE DIARRHEA CAUSED BY PATHOGENIC *E. COLI. (E.)* Poey, S. H. Med. Sch. U. Indonesia, Jakarta), J. W. Gautama, . Maksum and H. Ilahude. *Paediat Indonesia* 9(6): 47-254, 1969.

489 A NEW METHOD FOR TREATMENT OF CARCINOMA OF THE BREASTS AND COLON WITH 5-FLUOROUCIL. E.) Van Way III, C. W. (Vanderbilt U. Med. Ctr., ashville, Tenn.) and V. H. Reynolds. *Amer Surg* 6(4):210-218, 1970.

490 RECTAL OBSTRUCTION BY POSTPERFORATED COLONIC ABSCESS. (*E.*) Dietz, M. W. (Burge-rotestant Hosp., Springfield, Mo.). *Southern Med J* 3(3):327-329, 1970.

491 SURGICAL MANAGEMENT OF TRAUMATIC INJURIES OF THE COLON AND RECTUM. (*E.*) Ganchrow, I. (Evacuation Hosp., S. Vietnam), G. S. Lavenson, r. and J. J. McNamara. *Arch Surg* 100(4):515-520, 970.

492 SECOND-LOOK OPERATION FOR COLON CARCINOMA AFTER FLUOROURACIL THERAPY. (*E.*) Mackman, . (U. Wisconsin Med. Ctr., Madison), A. R. Curreri nd F. J. Ansfield. *Arch Surg* 100(4):527-531, 1970.

493 LATENT ANOMALIES ASSOCIATED WITH IMPERFORATE ANUS. (*E.*) Tank, E. S. (U. Michigan Med. Ctr., Ann Arbor). *Arch Surg* 100(4):512-514, 1970.

3494 PYLOPHLEBITIS AND LIVER ABSCESSES FOLLOWING APPENDICITIS. (*E.*) Till, H. J. (St. Margaret's Hosp., Montgomery, Ala.). *J Med Ass Alabama* 39(9):831-833, 1970.

3495 CANCER OF THE RECTUM. (*E.*) Lawrence, W. Jr. (Richmond, Va.) and J. S. Horsley III. *Virginia Med Month* 97(4):236-237, 1970.

3496 GEOGRAPHIC PATTERNS OF LARGE INTESTINE AND RECTAL MALIGNANCY MORTALITY IN VIRGINIA. (*E.*) Krasnow, S. (Georator Corp., Manassas, Va.). *Virginia Med Month* 97(4):226-227, 1970.

3497 MALIGNANT MUCOCELE OF THE APPENDIX WITH THROMBOEMBOLIC MANIFESTATION. (*E.*) Endlich, H. L. (Granada Hills Commun. Hosp., Calif.) and A. A. Roscher. *Int Surg* 53(3):210-217, 1970.

3498 LYMPHOID HYPERPLASIA OF THE LARGE INTESTINE ASSOCIATED WITH HYPERGLOBULINEMIA: REPORT OF A CASE. (*E.*) Wolfson, J. J. (U. Minnesota Hosp., Minneapolis), G. Goldstein, W. Krivit and R. Hong. *Amer J Roentgen* 108(3):610-614, 1970.

3499 PSEUDOMYXOMA PERITONEI COMPLICATING MUCOCELE OF THE APPENDIX. (*E.*) Jain, S. P. (Irwin Hosp., New Delhi, India). *J Indian Med Ass* 54(2):70-71, 1970.

3500 BULLET APPENDICITIS: "A NEW FORM OF LEAD POISONING." (*E.*) Rydell, W. B. (Southern Nevada Mem. Hosp., Las Vegas). *Rocky Mountain Med J* 67(3):48-50, 1970.

3501 MUCOID ADENOCARCINOMA IN ANORECTAL FISTULA. (*E.*) Lentini, J. (no affil), R. Ortiz and E. Fornells. *Amer J Proct* 21(2):103-112, 1970.

3502 A NEW METHOD TO AVOID COLOSTOMY IN OBSTRUCTIONS OF THE COLON DUE TO NON-OPERABLE CARCINOMA. (*E.*) Sanz, C. (Prov. Hosp., San Sebastian Sp.). *Amer J Proct* 21(2):127-136, 1970.

3503 ANORECTAL SURGICAL ANATOMY. (*E.*) De Los Rios, E. (Red Cross Proctol. Serv., Barcelona, Spain). *Amer J Proctol* 21(2):137-139, 1970.

3504 PALLIATIVE RADIATION THERAPY IN PATIENTS WITH CANCER OF THE COLON AND RECTUM. (*E.*) Whiteley, H. W., Jr. (Mem. Hosp., New York, N. Y.), M. W. Stearns, R. H. Leaming and M. R. Deddish. *Cancer* 25(2):343-346, 1970.

3505 BARIUM SULFATE INTO THE HEART FROM EXTRAPERITONEAL RUPTURE OF THE RECTOSIGMOID. (*E.*) Noveroske, R. J. (Gibson Gen. Hosp., Princeton, Ind.). *J Indiana Med Ass* 63(1):32-33, 1970.

- P:Morph (3086)
- P:Absorp (3114)
- P:Motil (3128)
- Diagproc (3271) (3277)
- D:S.Intest (3421)
- D:Gen:Parasit (3768) (3769) (3772)

3506 VITAMIN B_{12}-ABSORPTION IN ILEOSTOMY PATIENTS AFTER OPERATION FOR ULCERATIVE COLITIS. (*E.*) Hultén, L. (Sahlgren Hosp., U. Goteborg, Sweden), J. Kewenter, E. Persson and C. Ahren. *Scand J Gastroent* 5(2):113-116, 1970.

Vitamin B_{12} absorption was studied in 22 ileostomy patients at various intervals after operation (with panproctocolectomy) for ulcerative colitis. Low Schilling-test values (5 to 10%) were found in 11 patients and normal values (>10%) in 11 patients. No correlations between lowered vitamin B_{12} absorption and preoperative length of case-history, and low absorption values and length of resected ileum segment were observed. Low vitamin B_{12} absorption values were observed in 8 of 10 'short-term ileostomy patients' (tests performed within one yr or less) while low values were found in 3 of 12 'long-term ileostomy patients'. Vitamin B_{12} was normal (>200 pg/ml) in all 22 patients including those with lowered vitamin B_{12} absorption (similar results were found in patients observed for more than 3 yr). Folic acid in serum and blood, hemoglobin, serum iron, transferrin, and serum creatinine were at normal levels in all patients. Defective vitamin B_{12} absorption seemingly is due to bacterial imbalance in the terminal ileum after ileostomy.

3507 AN EPIDEMIOLOGICAL STUDY OF ULCERATIVE COLITIS AND REGIONAL ENTERITIS AMONG ADULTS IN BALTIMORE: III. PSYCHOLOGICAL AND POSSIBLE STRESS-PRECIPITATING FACTORS. (*E.*) Monk, M. (St. U. New York, Downstate Med. Ctr., Brooklyn), A. I. Mendeloff, C. I. Siegel and A. Lilienfeld. *J Chron Dis* 22(8-9):565-578, 1970.

Possible events considered as emotionally and psychologically disruptive were listed following interview of 158 ulcerative colitis patients and 69 regional enteritis patients (study groups) and 105 irritable colon patients and 735 healthy individuals (comparison groups) in Baltimore. Social and cultural discontinuities, geographic mobility, and job changes were studied, with little difference between groups although the study groups had a significantly different family background (more patients in the study group were only children and generally came from smaller families) than the comparison groups. These findings agree with the results obtained when more intensive psychiatric interviewing was used.

3508 A CASE OF ULCERATIVE COLITIS AND PYOSTOMATITIS VEGETANS IN AN AFRICAN. (*E.*) Naish, J. M. (Coll. Med., U. Lagos, Nigeria), B. D. Batchvarov and V. L. Lawoyin. *Gut* 11(1):38-40, 1970.

A case of pyostomatitis vegetans and ulcerative colitis in a 26-yr-old African male is described. The colitis, confirmed clinically and radiologically, antedated the development of pyostomatitis. Prednisone (40 mg p.o. daily for 7 days) was given in divided dose; after 7 days the dosage was reduced to 20 mg. Within 48 hr of the beginning of treatment, the swelling in the oral mucosa subsided, the pinpoint pustular lesions regressed, the rough and granular appearance of the buccal mucosa changed, and hyperemia was reduced. There was less eversion of the lower lip and also a slight improvement in the bowel condition, with a drop in the daily number of stools to four. After 3 months, the mouth lesions remained healed but the colitis remained slightly active with an average of 4 stools daily. The patient's general condition was good and is maintained only on prednisone (15 mg/day).

3509 CHROMOSOMAL ABERRATIONS IN PATIENTS WITH ULCERATIVE COLITIS. (*E.*) Konstantinova, B. (Postgrad. Med. Inst., Sofia, Bulgaria) and N. Nedkova-Bratanowa. *Digestion* 2(6):329-337, 1969.

Cytogenic examinations were conducted to study chromosomal aberrations in 9 patients suffering from severe ulcero-hemorrhagic colitis. A high degree of aneuploidy (up to 44%) and structural aberrations (up to 17.5%) were observed in all patients and aneuploidy had a pronounced hypodiploid character. Chromosomal structural aberrations affected both adhesions and chromosomes in the form of dicentric chromosomes and adhesions between chromosomes. There was a parallelism between the degree of chromosomal aberrations in somatic cells and severity of disease. Aberrations seemingly are due first of all to mutagen influence of the X-rays which had been received during X-ray examinations, to antibiotics, and to other drugs as well as partially to considerable metabolic aberrations which exist in patients.

3510 IRRITABLE COLON SYNDROME. (*E.*) Pimparkar, B. D. (K. E. M. Hosp., Bombay, India). *J Indian Med Ass* 54(3):95-103, 1970.

3511 GLUCOCORTICOIDS IN THE TREATMENT OF ULCERATIVE COLITIS. (*Ser.*) Ljaljevic, J. (Sch. Med. Beograd, Yugoslavia), S. Rodic and J. Burijan. *Srpski Arh Celok Lek* 97(6):601-605, 1969.

3512 CLINICAL COURSE OF ULCERATIVE PROCTOSIGMOIDITIS. (*E.*) Nugent, F. W. (Lahey Clin. Found., Boston, Mass.) M. C. Veidenheimer, S. Zuberi, M. M. Garabedian and N. K. Parikh. *Amer J Dig Dis* 15(4):321-325, 1970.

3513 MEDICAL THERAPY FOR ULCERATIVE COLITIS. (*It.*) Barany, F. (St. Eric Hosp., Stockholm, Sweden). *Minerva Med Giuliana* 9(3):129-134, 1969.

14 BENIGN SOLITARY ULCER OF THE RECTUM--A
REPORT OF 5 CASES. *(E.)* Jalan, K. N.
estern Gen. Hosp., Edinburgh, Scotland), P. W.
unt, N. Maclean and W. Sircus. *Scand J*
stroent 5(2):143-147, 1970.

15 ULCERATIVE COLITIS COMPLICATED BY DIFFUSE
CARCINOSIS OF THE COLON. *(Nor.)* Bryld,
(Central Hosp., Naestved, Norway). *Ugeskr Laeg*
2(7):337-338, 1970.

- D:S.Intest:Regent (3434) (3435)

PANCREAS

16 ZINC CONTENT OF PANCREATIC TUMORS OF IS-
LET CELL ORIGIN. *(E.)* Tomita, T. (Yoko-
ma City U. Sch. Med., Japan). *J Nat Cancer Inst*
(2):329-337, 1970.

e quantity of zinc in 5 islet cell tumors of the
ncreas was measured by direct chemical analysis,
d a histochemical correlation was made in 2 pan-
eatic islet cell tumors. The zinc content of 4
mors was within the expected range for normal pan-
eatic tissue (54 to 96 μg/gm wet weight), but one
mor had a concentration of 169 μg/gm wet weight.
e pancreatic tissue immediately surrounding 2 is-
t cell tumors contained 25 to 50% of the normal
ncentration. Histochemical studies (zinc detection
th dithizon and a modified Voight's sulfide silver
ocedure) showed only weak staining of zinc in these
o tumors. The tissue of the islet cell tumors con-
ined greater concentrations of zinc than tissues
om exocrine pancreatic tumors (21 to 29 μg/gm wet
ight) and from the pancreas of patients with ad-
nced diabetic mellitus (16 to 110 μg/gm wet
ight).

517 DIAGNOSTIC ERRORS IN THE TREATMENT OF
PANCREATIC CYSTS IN CHILDREN. *(Rus.)*
tkovsky, N. B. (Kiev Med. Inst., USSR). *Vestn*
ir 102(12):109-111, 1969.

518 PANCREATIC FISTULA. *(E.)* Jordan, G. L. Jr.
(VA Hosp., Houston, Texas). *Amer J Surg*
19(2):200-207, 1970.

519 CRYOSURGICAL NECROSIS OF THE HEAD OF THE
PANCREAS. *(E.)* Myers, R. S. (Nat. Cancer
nst., Nat. Inst. Hlth., Bethesda, Md.), W. G.
ammond and A. S. Ketchem. *Ann Surg* 171(3):413-418,
970.

520 RECOGNITION AND MANAGEMENT OF THE DIARRHEAL
SYNDROME CAUSED BY NONBETA ISLET CELL
UMORS OF THE PANCREAS. *(E.)* Kraft, A. R. (Ohio St.
. Coll. Med., Columbus), R. K. Tompkins and R. M.
ollinger. *Amer J Surg* 119(2):163-170, 1970.

3521 SYSTEMIC STEATONECROSES OF PANCREATIC ORIGIN. *(Fr.)* Fournie, A. (Purpan Hosp., Toulouse, France), C. Ayrolles, F. De Maulde and J. Caniac. *Rev Med Toulouse* 5(9):759-774, 1969.

3522 ENZYME SUBSTITUTION FOR SURGICAL INSUFFICIENCY OF THE PANCREAS. *(Ger.)* Tillander, H. (Ekmanska Hosp., Goteborg, Sweden). *Munchen Med Wschr* 112(9):388-393, 1970.

3523 EXTERNAL PANCREATIC INSUFFICIENCY WITH CHRONIC GRANULOPENIA: RECENT OBSERVATIONS ASSOCIATED WITH BONE ANOMALIES. *(Fr.)* St-Martin, J. (Hosp. Child. Dis., Paris, France), J.-P. Fournet, J. Charlas, G. Schaison, A. Nodot, B. Meyer and J. Vialatte. *Arch Franc Pédiat* 26(8):861-871, 1969.

3524 STUDY OF THE EXOCRINE PANCREATIC MUCOVISCIDOSIS. *(Fr.)* Hermier, M. (Hosp. Renee Sabran, Giens, France), M. Mathieu, M. Fillat, R. Gilly, J. P. Chazalette and J. Cotte. *Rev Franc Etud Clin Biol* 14(9):867-884, 1969.

3525 COMPARATIVE APPRAISAL OF SOME FUNCTIONAL TESTS IN EXOCRINE PANCREATIC DISEASES. *(It.)* Nociti, V. (Hosp. S. Gerardo dei Tintori, Monza, Italy), U. D'Alonzo and G. Porta. *Osped Ital Chir* 20(6):493-522, 1969.

3526 PANCREATIC LITHIASIS. *(E.)* Abraham, P. A. (Med. Coll. Hosp., Trivandrum, India). *Indian J Surg* 31(6):588-596, 1969.

3527 CRYOSURGERY OF PRIMATE PANCREAS. *(E.)* Hammond, W. G. (Natl. Cancer Inst., Natl. Inst. Hlth., Bethesda, Md.), R. S. Myers and A. S. Ketcham. *Cancer* 25(2):411-414, 1970.

- P:Morph (3034)
- P:Secr:Hepatobil (3172)
- Diagproc (3262) (3282) (3309)
- D:Stomduo (3372)
- D:S.Intest (3417)
- D:L.Intest (3464)

PANCREAS

Pancreatitis

3528 SERUM INSULIN LEVELS IN PATIENTS WITH CHRONIC PANCREATITIS. *(E.)* Rogers, J. B. (Hahnemann Med. Coll. Hosp., Philadelphia, Pa.), J. M. Howard and F. W. Pairent. *Amer J Surg* 119(2): 171-176, 1970.

Insulin response was compared in patients with chronic pancreatitis (6 with diabetes, 4 without diabetes) to that in normal subjects (6) and diabetic, nonpancreatitis patients (8). Oral glucose tolerance tests performed in all subjects showed a fasting blood sugar level and serum insulin levels of 69 mg% and 25 μU/ml, resp., in the controls, 84 mg% and 40 μU/ml in the nonpancreatic diabetics, 84 mg% and 9 μU/ml in the pancreatic diabetics, and 64 mg% and 20 μU/ml in pancreatitis patients without diabetes. These levels peaked 1 hr after glucose to 117 mg% and 166 μU/ml in the controls, and to 132 mg% and 174 μU/ml in pancreatitis patients without diabetes. In patients with only diabetes, and in pancreatic diabetics, blood glucose peaked after 1 hr at 198 and 222 mg%, resp., while serum insulin peaked 2 hr after glucose at 321 and 64 μU/ml, resp. (after 5 hr, all levels returned to normal). The mean serum insulin level was doubled in normal subjects within 5 min after an i.v. injection of secretin. In patients with pancreatic diabetes secretin raised the insulin levels from 11 to 19 μU/ml (in both controls and pancreatic diabetics these levels returned to normal.

3529 LOW MOLECULAR WEIGHT DEXTRAN IN EXPERIMENTAL PANCREATITIS. *(E.)* Carey, L. C. (Presbyterian-U. Hosp., Pittsburgh, Penn.). *Amer J Surg* 119(2):197-199, 1970.

Hemorrhagic pancreatitis was produced in 3 groups of 10 animals 8 hr after pancreatic infusion of saline (30 cc/kg), albumin (3 cc/kg) and low molecular weight dextran (7 cc/kg), resp. Death occurred in 9 of 10 animals in both the saline and the albumin groups within 24 hr, while only 4 of the 10 animals receiving dextran died. After 48 hr there was no change in the saline group, all animals in the albumin group died, and 5 in the dextran group died. Average hematocrit in animals receiving saline was 42.3%, in animals receiving albumin 37.6%, and in animals receiving dextran 41.9% for an overall average of 40.6%. In 4 hr, the hematocrit increased an average of 13.2%; there was no significant difference between groups. In the animals surviving 24 hr, the hematocrit had begun to return to normal or had remained nearly unchanged from the 4-hr levels (again there was no significant difference between the 3 groups).

3530 LONG-TERM DEVELOPMENT OF CHRONIC PANCREATITIS IN 113 CASES: I. A STUDY OF SPONTANEOUS EVOLUTION. *(Fr.)* Levrat, M. (Hosp. Eduoard Herriot, Lyon, France), L. Descos, B. Moulinier and J. Pasquier. *Arch Franc Mal Appar Dig* 59(1-2):5-18, 1970.

3531 NUTRITION IN PANCREATITIS. *(Fr.)* Sarles, H. (no affil) and A. Gerolami. *Rev Prat* 20(6): 867-871, 1970.

3532 SURGICAL TREATMENT OF CHRONIC PANCREATITIS. *(Rus.)* Shalimov, A. A. (Kharkov Inst. Gen. Emerg. Surg., USSR) and A. Kh. Shamanov. *Klin Khir* 52(1):6-11, 1970.

3533 DIABETES MELLITUS IN PATIENTS WITH PANCREATITIS. *(Rus.)* Fomenko, L. I. (Kiev Med. Inst. USSR). *Klin Khir* 52(1):11-17, 1970.

3534 LIPID METABOLISM IN ACUTE PANCREATITIS. *(Rus.)* Shorluyan, P. M. (Rostov-on-the-Don Med. Inst., USSR), E. K. Alimova, T. M. Tereshchenko and R. F. Kamynina. *Klin Khir* 52(1): 17-22, 1970.

3535 EFFECT OF ANTICOAGULANTS ON THE COURSE OF EXPERIMENTAL ACUTE PANCREATITIS. *(Rus.)* Synovets, A. S. (Pirogov Inst. Med., Odessa, USSR), A. L. Dekhitar and A. P. Levitsky. *Klin Khir* 52(1):33-36, 1970.

3536 CATIONIC METABOLIC DISORDERS IN ACUTE PANCREATITIS. *(Rus.)* Geshelin, S. A. (Clin. Hosp., Odessa, USSR) and V. M. Lashchevker. *Klin Khir* 52(1):26-33, 1970.

3537 CALCIFYING PANCREATITIS AND PANCREATIC LITHIASIS. *(It.)* De Medici, A. (Dept. Gen. Clin. Surg., Surg. Ther., U. Pavia, Italy), P. Colombo and L. Bonandrini. *Minerva Gastroent* 15(3):112-131, 1969.

3538 STUDIES ON SIGNIFICANCE OF AEROBIC AND ANEROBIC BACTERIAL FLORA IN EXPERIMENTAL PANCREATITIS. *(Jap.)* Onishi, T. (Nagoya City U. Med. Sch.). *Nagoya City Univ Med Ass* 20(3):595-612 1969.

3539 PORTAL HYPERTENSION IN CHRONIC PANCREATITIS: SPLENOPORTOGRAPHIC STUDY OF 20 CASES. *(Por.)* Reibscheid, S. (no affil), M. deP. Vilela, P. Alberto, De J. Faria, F. Secaf, S. J. Mizsputen, A. J. Ganc and E. J. Larsson. *Rev Ass Med Brasil* 15(10):397-402, 1969.

3540 IS ANURIA RELIEVED BY HEPARIN IN THE COURSE OF INTRAVASCULAR COAGULATION CAUSED BY ACUTE PANCREATITIS? *(Fr.)* Berquet, J.-C. (C. H. U., Reims, France), J.-C. Pire and B. Lardennois. *Anesth Analg (Paris)* 26(4):609-618, 1969.

3541 ACUTE PANCREATITIS IN SURGERY. *(Ger.)* Alieff, A. (Surg. Clin. U. Dusseldorf, Germany). *Zbl Chir* 94(51):1743-1747, 1969.

- Diagproc (3283)
- D:Livbil:Gallb (3689)

2 MITOCHONDRIAL ANTIBODIES AND SUBCLINICAL
LIVER DISEASE. (*E.*) Walker, J. G. (Central
dlesex Hosp., London, England), D. Doniach and I.
iach. *Quart J Med* 39(153):31-48, 1970.

rty-five patients (6 male, aged 41 to 63; 29 fe-
e, 19 to 78) without overt clinical liver disease
whose serum gave positive immunofluorescent re-
ions for mitochondrial antibodies were evaluated
the presence of hepatic abnormalities. Nineteen
fered from collagenoses or related disorders, 10
ers had thyroid or gastroimmune disease—only 3
unrelated miscellaneous conditions. In 10 of
35 patients there was evidence of liver abnor-
ity and in 8 where biopsies were available hepa-
is was seen on histological examination, its
erity being proportional to the degree of bio-
mical change. This subclinical hepatitis had
tological similarities to 'aggressive' hepatitis
hough usually in milder form, and it is regarded
an expression of an autoimmune condition that
l not necessarily progress to florid active
onic hepatitis or to primary biliary or crypto-
ic cirrhosis (the only three chronic liver con-
tions in which the antibodies are regularly
nd). The mitochondrial antibodies are considered
be one of the markers of an underlying pathogenic
ocess common to these diseases.

3 CIRRHOSIS AND CARCINOMA OF THE LIVER IN
MALE RATS GIVEN SUBCUTANEOUS CARBON TETRA-
ORIDE. (*E.*) Reuber, M. D. (Natl. Cancer Inst.,
hesda, Md.) and E. L. Glover. *J Nat Cancer Inst*
(2):419-427, 1970.

atocellular carcinomas (and hyperplastic nodules
cirrhosis) developed in 8 of 13 Osborne-Mendel
12 of 15 Japanese male, 12 week old rats sur-
ing for as long as 70-105 weeks on semi-weekly
c. injections of 1.3 ml/kg of a 50% solution of
bon tetrachloride and corn oil. Average survival
eks in various strains of rats were: Japanese (47),
orne-Mendel (44), Wistar (33), Sprague-Dawley (13)
Black (11). Well-differentiated carcinomas
e observed in Japanese, Osborne-Mendel, and Wistar
rains, with less-differentiated carcinomas only
Japanese rats. Carcinomas of the liver developed
ong with mild or moderate rather than severe
rrhosis (rats with severe cirrhosis died early).
star rats surviving up to 68 weeks had smaller
rcinomas, nodules of hyperplasia, and moderate-
-severe cirrhosis. One Japanese rat had metastases
the lung and lesions of the spleen, thyroid, and
dney.

44 THE EFFECTS OF THIOPENTONE ON THE LIVER.
A STUDY ON 1030 ANESTHESIAS IN HEPATIC
TIENTS. (*E.*) Tudosie, N. (Coletina Hosp.,
carest, Rumania), N. Cinca and C. Marinescu.
*ogress In Anesthesiology: Proceedings of the
urth World Congress of Anesthesiologists* 1260-
61, 1968.

e postoperative effects of 1030 instances of
lanced anesthesia (with thiopentone, hydroxydione,
her or methoxyfluorane) on liver function were
studied in patients with liver or bile duct carcinomas, hydatid cysts, advanced cirrhosis, mechanical jaundice, and pancreatic carcinoma. Methoxyfluorane, thiopentone and hydroxydione were well tolerated and did not affect serum transaminase tests, electrophoresis, the prothrombin index, or liver biopsy. Ether was the worst-tolerated anesthetic and caused delayed recovery from surgery, hypersecretion, and a significant increase in Quick's test.

3545 NORMAL SULFOBROMOPHTHALEIN RETENTION IN ESTABLISHED LIVER DISEASE. (*E.*) Schoenfield, L. J. (Mayo Clin., Rochester, Minn.), G. R. Onstad and N. P. Goldstein. *Amer J Dig Dis* 15(4):337-342, 1970.

Several indices of BSP transport and metabolism (fractional clearance, duodenal drainage appearance time, conjugation, relative storage capacity and transport maximum) were measured in normal subjects and in patients with hemochromatosis, Wilson's disease or cirrhosis (all patients had normal BSP retention). Values for fractional clearance (%/min), duodenal drainage appearance time (min), conjugation (%), transport maximum (mg/min) and relative storage capacity (mg/min/100ml) after single i.v. injection of 5 mg/kg of BSP were 11.9, 17.3, 64.4, 8.2 and 60.6, resp., in normal subjects. Fractional clearance and relative storage capacity were decreased and transport maximum and conjugation were normal in all patients. Values for serum bilirubin, glutamic oxalacetic acid, protein electrophoresis and alkaline phosphatase were more abnormal in cirrhotic patients with abnormal BSP retention than in those with normal BSP retention.

3546 INTRAPORTAL INFUSION OF OXYGENATED BLOOD AS A METHOD OF PREVENTION AND TREATMENT OF ACUTE HEPATIC INSUFFICIENCY DURING ANESTHESIA, OPERATION, AND RESUSCITATION IN CHILDREN. (*E.*) Manevich, A. Z. (Rusakov Child. Hosp., Moscow, USSR), V. G. Akopian and T. D. Kuznetsova. *Progress in Anesthesiology: Proceeding of the Fourth World Congress of Anesthesiologists.* 927-933, 1968.

Prolonged intraportal infusion (through the catheterized umbilical vein) of oxygenated, freshly citrated blood (1.5-3.0 ml/min) and medicinal agents (glucose-Novocaine solutions) was performed on 33 infants operated on for liver cirrhosis and for portal hypertension in order to eliminate regional hypoximia and prevent hepatargy and to assist the compensatory liver mechanisms. Of 8 cirrhotic patients subjected to intraportal perfusion of oxygenated blood and drugs, 4 recovered from the comatose condition and were successfully operated upon. Four patients who were unconscious for more than 24 hr and were unresponsive to physical stimuli, regained consciousness 2-2½ hr following the infusion of oxygenated blood. In all children where infusion was used during surgery and in the post-operative period, acute hepatic insufficiency was prevented.

3547 SUPPRESSION OF ERYTHROPOIESIS BY ALCOHOL. (*E.*) Hourihane, D. O'B. (Trinity Coll. Dublin, Ireland) and D. G. Weir. *Brit Med J* 1(5688): 86-89, 1970.

Changes in iron metabolism were studied in 23 alcoholic patients (well nourished and non-anemic) following cessation of prolonged alcohol intake. Serial studies performed at admission showed serum folate levels from 1.0 to 9.2 ng/ml, mean 3.2 ng (normal range, 2.1 to 9.5 ng/ml, mean 5.1 ng) and serum vitamin-B_{12} levels from 225 to 850 pg/ml, mean 400 pg (normal range 125 to 1025 pg/ml, mean 472 pg). Serum iron levels varied markedly from 70 to 309 μg/ml, mean 172 μg (normal range 60 to 180 μg/ml) and there was a sustained fall in serum iron (maximum decrease to approximately 100 μg/ml) during the first three days after admission and alcohol cessation (slowly rising back to normal). Serum folate values showed a fall in mean level (approximately 2.5 ng/ml) for the first 48 hr after admission, but serum vitamin-B_{12} levels did not vary significantly during this period. Five non-alcoholic psychiatric patients admitted at same time and receiving similar diets and sedation showed no comparable fall in serum iron or folate levels. Hemosiderin levels were increased after admission in 19/23 alcoholic patients but repeat examination 2 to 7 days later indicated a return to normal hemosiderin levels within erythroblasts in all patients. Prolonged alcohol consumption seemingly interferes with heme synthesis, most probably by direct effect.

3548 ENCEPHALOPATHY AFTER PORTACAVAL SHUNTING MANAGED WITH LACTULOSE. (*E.*) Brown, H. (Boston City Hosp., Mass.), C. Trey and W. V. McDermott, Jr. *Amer J Surg* 119(2):132-137, 1970.

Four case reports are presented of patients (3 women, 1 man) with hepatic encephalopathy after portacaval shunting who were treated randomly with either 50% lactulose with 20% sorbitol, or with 70% sorbitol slone, while on a diet providing a reasonable protein intake. Data from blood ammonium levels, EEG tracings, colon pH, and number of hospital admissions required showed that neither sugar was toxic. The underlying liver disease did not appear to be altered although the patients were helped by lactulose and occasionally by sorbitol, suggesting that the cathartic effect of both sugars was beneficial. Lactulose did relieve neurological symptoms and produced a fall in blood ammonium levels; hospital admissions were also reduced.

3549 DNA'S FROM HUMAN HEPATOMA AND GASTRIC CANCER MITOCHONDRIA. (*E.*) Take, S. (Okayama Med. Sch., Japan). *Acta Med Okayama* 23(6):465-479, 1969.

Livers and hepatomas were sampled three hours after death from individuals who had never received antitumor agents or x-ray therapy, and gastric cancers were sampled from tissue immediately after operation and electron microscopic and biochemical analyses performed. Mitochondria isolated from human liver, hepatoma and gastric cancer were found to contain DNA and the DNA content per mitochondri protein was about 10 times as much in hepatomas as in normal liver. Circular DNA molecules were foun in the mitochondria of normal liver, hepatoma and gastric cancer. Circular DNA's from normal liver and cancer mitochondria were about 5μ in length and the frequency of circular DNA's of multiple or shorter length was higher in cancer mitochondrial DNA.

3550 METABOLISM OF PLASMA LIPIDS IN PARTIALLY HEPATECTOMIZED RATS. (*E.*) Olivecrona, T. (Dept. Chem., U. Umea, Sweden) and G. Fex. *Biochim Biophys Acta* 202(2):259-268, 1970.

The metabolism of labeled plasma lipids was studied in partially hepatectomized male, Sprague-Dawley rats and controls subjected to laparotomy and handling of liver. Disappearance of i.v. injected $[^{3}H]$ oleic acid chylomicra from circulation was retarded after partial hepatectomy compared to controls. Injected dose of label contained 3.5 x 10^6 counts/min and the half-lives ± SD for injected label were 4.75 ± 1.06 and 2.79 ± 0.79 min ($p < 0.01$); 6.64 ± 1.45 and 4.37 ± 0.96 min ($p < 0.01$); and 6.28 ± 1.34 and 3.00 ± 0.49 min ($p < 0.01$) for partially hepatectomized and laparotomized rats at 4, 20, and 49 hr after operation resp. With regard to liver uptake, two min after $[^{3}H]$ oleic acid injection, less than 4% of radioactivity remained in blood of laparotomized rats and less than 10% in blood of partiall hepatectomized rats. At 20 min after injection, corresponding figures were less than 4% in all laparotomized groups and less than 6, 16 and 13% in partially hepatectomized groups at 4, 20 and 49 hr after operation. Similar results were obtained in experiments with labeled oleic acid. Incorporation of labeled glycerol into liver lipids was also increased at 4 hr following partial hepatectomy. Whe chylomicra labeled *in vitro* with cholesteryl palmitate were injected, approximately 80% of radioactiv ty was in the liver 60 min after injection in both groups of rats. The main difference between 2 grou of rats seemingly is that the second part of the disappearance curve was slower in partially hepatectomized rats. Initial radioactivity disappearance seemingly was retarded in partially hepatectomized rats to same degree as disappearance of fatty acid labeled chylomicra.

3551 THE HEPATIC RESPONSE TO ENDOTOXIN SHOCK: HEMODYNAMIC AND ENZYMATIC OBSERVATIONS. (*E.*) Rangel, D. M. (U. California Los Angeles Sch. Med.), A. Dinbar, G. H. Stevens, R. Cooper and E. W. Fonkalsrud. *J Surg Res* 10(4):181-188, 1970.

The role of the liver in endotoxin shock was evaluated by injecting *Escherichia coli* endotoxin into the femoral artery or portal vein of dogs in which the liver had been excluded from circulation, and i dogs with intact livers. Systemic administration o endotoxin produced a more severe hypotension than does injection into the portal vein, which suggests that endotoxin may be removed from the circulation and detoxified by the hepatic circulation. When the liver was excluded from the circulation, a

found hypoglycemia followed administration of
otoxin, and death soon occurred. Circulating
T, SGPT and alkaline phosphatase levels increased
er administration of endotoxin in dogs with nor-
hepatic circulation and the blood LDH levels
e higher in dogs in which the hepatic inflow was
luded, which suggests an extrahepatic origin of
LDH isoenzymes. The liver seemingly exerts a
tective effect during the initial phase of
otoxin shock and with the progression of shock
liver deteriorates and hepatic intracellular
abolites may be released into the circulation to
elerate the irreversibility of shock.

2 MECHANISM AND ANATOMOCLINICAL MEANING OF
OPACIFICATION OF THE LIVER DURING LYMPHO-
PHY. *(It.)* Bobbio, P. (2nd Dept. Gen. Clin.
g., Surg. Ther., U. Parma, Italy) and G. Barboso.
erva Chir 25(4):247-255, 1970.

3 ARTHROPATHY AND LIVER DISEASE. *(E.)*
Whelton, M. J. (Wetsern Gen. Hosp.,
nburgh, Scotland). *Brit J Hosp Med* 3(2):
-247, 1970.

4 IMPAIRED FORMATION OF GLUCURONIC ACID CON-
JUGATES IN LIVER TISSUES OF DIABETIC RATS.
r.) (Muleer-Oerlinghausen, Inst. Pharmacol. Toxi-
. U. Gottingen). *Naunyn Schmiedeberg Arch Phar-*
ol 265(4):372-382, 1970.

55 TREATMENT WITH BARBITURATES IN JAUNDICE
CAUSED BY DEFECTIVE BILIRUBIN CONJUGATION.
.) Ciampolini, M. (Pediat. Clin., U. Florence,
aly). *Minerva Pediat* 21(52):2440-2446, 1970.

56 BLOOD AMMONIUM AND ACID BASE BALANCE DURING
ACUTE ATROPHY OF THE LIVER. *(Fr.)* Opolon,
(C.H.U. St. Antoine, Paris, France), P. Hadchouel,
Del Corse and J. Caroli. *Ann Med Intern* 121(1):
15, 1970.

57 FETAL PROTEINS AND HEPATOMAS. *(Fr.)*
Burtin, P. (Inst. Sci. Res. Cancer,
llejuif, France). *Rev Franc Etud Clin Biol* 14(6):
3-555, 1969.

58 BLOOD AMMONIA AND ACID BASE EQUILIBRIUM
IN THE COURSE OF ACUTE ATROPHY OF THE
VER. *(Fr.)* Hadchouel, P. (no affil), P. Opolon
d J. Caroli. *Rev Med Chir Foie* 44(6):291-304,
69.

59 GEOGRAPHY OF PRIMARY LIVER CANCER. *(E.)*
anonymous. *Brit Med J* 1(5693):381-382,
70.

60 ANGIOGRAPHY OF LIVER ABSCESS IN GRANU-
LOMATOUS DISEASE OF CHILDHOOD: A CASE
PORT. *(E.)* Nebesar, R. A. (Harvard Med. Sch.,
Boston, Mass.), M. Tefft and A. H. Colodny. *Amer J Roentgen* 108(3):628-631, 1970.

3561 STUDIES ON RECURRENCE OF TUMORS: II RECURRENCE OF THE ASCITES HEPATOMA AH 130. *(Jap.)* Irino, H. (Gifu U. Sch. Med., Japan). *Acta Schol Med Univ Gifu* 16(4-5):636-641, 1969.

3562 STUDIES ON AMEBOID MOVEMENT IN ASCITES TUMOR CELLS. *(Jap.)* Shimizu, M. (Gifu U. Sch. Med., Japan). *Acta Schol Med Univ Gifu* 16(4-5):493-502, 1969.

3563 TREATMENT OF HEPATIC METASTASES. *(Fr.)* Cappelaere, P. (no affil), A. Demaille and L. Adenis. *Clinique* 65(662):31-36, 1970.

3564 CLINICAL EXPERIENCES WITH A NEW LIVER PROTECTOR, EUSINEX. *(It.)* Bandini, S. (Trabattoni Hosp., Ronzoni di Seregno, Italy), F. Colzani and D. Sarvello. *Gazz Med Ital* 128(10): 589-591, 1969.

3565 THE MORPHOLOGICAL AND FUNCTIONAL CHANGES OF LIVER IN "COMA DEPASSE". *(It.)* Arosio, G. (City Hosp, Brescia, Italy), A. Albertini, L. Bordoni and S. Fiaccavento. *Minerva Anest* 35(11): 1122-1129, 1969.

3566 KUPFFER-CELL SARCOMA. *(E.)* Joske, R. A. (Dept. Med., U. Western Australia, Perth) and J. B. Blackwell. *Amer J Dig Dis* 15(2):133-138, 1970.

3567 NUCLEAR tRNA AT DIFFERENT STAGES OF CHEMICALLY INDUCED CANCER OF THE LIVER. *(Uk.)* Korotkoruchko, V. P. (Inst. Exp. Clin. Oncol., Min. Publ. Hlth., Kiev, Ukraine, USSR), O. M. Platonov, A. S. Polishchuk and V. G. Pinchuk. *Ukr Biokhim Zh* 41(6):647-654, 1969.

3568 HEPATIC METABOLISM IN PERITONITIS. *(Rus.)* Neiko, E. M. (Ivan Franko Med. Inst., Moscow, USSR) and A. M. Fedorchuk. *Pat Fiziol Eksp Ter* 13(6):71-72, 1969.

3569 LIVER NECROSIS FOLLOWING ACCIDENTAL LIGATION OF THE HEPATIC ARTERY DURING GASTRIC RESECTION. *(Rus.)* Fedko, S. V. (Nikopol City Hosp., USSR) and R. M. Rudenko. *Klin Khir* 52(1):52-53, 1970.

3570 TWO CASES OF PRIMARY CARCINOMA OF THE LIVER IN CHILDREN. *(E.)* Rutten, A. P. M. (St. Laurentius Hosp., Roermond, Netherlands), P. J. H. Sikkenk and A. T. Ariens. *Arch Chir Neerland* 21(4):267-276, 1969.

3571 SURGICAL BASIS FOR ARTERIAL INFUSION CHEMOTHERAPY OF DISSEMINATED CARCINOMA OF THE LIVER. (*E.*) Watkins, E., Jr. (Lahey Clin. Found., Boston, Mass.), A. M. Khazei and K. S. Nahra. *Surg Gynec Obstet* 581-605, 1970.

3572 SERUM GUANASE IN LIVER DISEASES. (*Jap.*) Hattori, N. (Tokyo Med. Coll., Japan), K. Nakanishi, Y. Kawamura and M. Takenoshita. *J Tokyo Med Coll* 27(2):229-233, 1969.

3573 INHIBITION OF PROLIFERATIVE ACTIVITY OF PARTIALLY RESECTED LIVER AFTER ADMINISTRATION OF DIETHYLNITROSAMINE. (*Ger.*) Rabes, H. (Path. Inst. U. Munich, Germany), R. Hartenstein and P. Scholze. *Z Krebsforsch* 73(3):239-241, 1970.

3574 A CASE OF CRIGLER-NAJJAR DISEASE. (*It.*) Bartolozzi, G. (Pediat. Clin., U. Florence, Italy), M. Ciampolini, R. Salti and M. Verotti. *Minerva Pediat* 21(51):2393-2404, 1969.

3575 THE HEPATIC OVARIAN SYNDROME: ETIO-PATHOGENIC AND CLINICO-THERAPEUTIC STUDY. (*It.*) Salme, A. (Hosp. Civil Genova-Nervi, Italy). *Ateneo Parmense* 39(supp. 6):173-184, 1968.

3576 NEW OBSERVATIONS ON MICROBODIES: A CYTOCHEMICAL STUDY ON CPIB-TREATED RAT LIVER. (*E.*) Legg, P. G. (Dept. Anat. U. Minnesota, Minneapolis) and R. L. Wood. *J Cell Biol* 45(1):118-129, 1970.

3577 ALA-DEHYDRASE AND ALA-OXYDASE ACTIVITY IN SEVERE LIVER FAILURE. (*It.*) Pisani, W. (Dept. Occup. Med., U. Turin, Italy), A. Bonzanino, L. Rasetti and P. A. Prevot. *Gazz Med Ital* 128(11):626-629, 1969.

3578 LIVER FUNCTION AND SUGAR METABOLISM DURING TREATMENT WITH 6-α-METHYL-17-α-HYDROXY-PROGESTERONE ACETATE IN ADENOCARCINOMA OF THE BODY OF THE UTERUS. NOTE I. INFLUENCE ON THE PROTEIN ELECTROPHORESIS PICTURE, TRANSAMINASES AND SERUM ALKALINE PHOSPHATASE. (*It.*) Lanza, A. (Sant'Anna Obstet. Gynec. Hosp., Turin, Italy). *Minerva Ginec* 21(23):1612-1623, 1969.

3579 BIOCHEMICAL AND STRUCTURAL CHANGES IN RAT LIVER RESULTING FROM THE PARENTERAL ADMINISTRATION OF A LARGE DOSE OF SODIUM SALICYLATE. (*E.*) Bullock, G. R. (Res. Div., Ciba, Horsham, England), V. B. Delaney, B. C. Sawyer and T. F. Slater. *Biochem Pharmacol* 19(1):245-253, 1970.

3580 STIMULATION OF HEPATIC DRUG-METABOLIZING ENZYMES BY CHLOROPHENOTHANE (DDT); THE RELATIONSHIP TO LIVER ENLARGEMENT AND HEPATOTOXICITY IN THE RAT. (*E.*) Hoffman, D. G. (Lilly Toxicol Lab., Eli Lilly Co., Greenfield, Indiana), H. M. Worth, J. L. Emmerson and R. C. Anderson. *Toxic Appl Pharmacol* 16(1):171-178, 1970.

3581 ANATAMO-PATHOLOGICAL AND STATISTICAL CONTRIBUTIONS TO THE STUDY OF HEPATIC TUBERCULOSIS. (*It.*) Vercellino, A. (Hosp. St. Louis Gonzaga, Turin, Italy), B. Emanuele and C. Banaudi. *Minerva Med* 61(9):350-356, 1970.

3582 SURGICAL MANAGEMENT OF INTRAHEPATIC HEMATOMAS. (*E.*) Thomas, C. S., Jr. (Vanderbi U. Sch. Med., Nashville, Tenn.), R. B. Adkins Jr., V. C. Lanier Jr. and J. H. Foster. *Amer Surg* 36(3) 171-176, 1970.

3583 PREGNANCY AND EXTRAHEPATIC PORTAL HYPERTENSION. (*E.*) Hendry, W. F. (Roy. Infi Glasgow, Scotland) and W. A. Mackey. *Brit J Surg* 56(12):909-912, 1969.

3584 HEMOSTASIS DURING LIVER RESECTIONS. (*E.*) Clark, W. R. Jr. (Moyer Clin., Baraga, Mich.) and R. P. Leather. *Surgery* 67(3):556-557, 1970.

3585 CONTROL OF THE HEPATIC PARENCHYMA BY DIR COMPRESSION: A NEW INSTRUMENT. (*E.*) Do D. B. (Walter Reed Army Med. Ctr., Washington, D. H. W. Kugler and R. V. Moseley. *Surgery* 67(4):720-724, 1970.

3586 TRAUMATIC INTRAHEPATIC HEPATIC ARTERY-PORTAL VEIN FISTULA WITH ASSOCIATED HEMOBILIA. (*E.*) Cleveland, R. J. (Harbor Gen. Hosp., Torrance, Cal.), B. M. Jackson, P. H. Newman and R. J. Nelson. *Ann Surg* 171(3):451-454, 1970.

3587 STUDIES ON IRON METABOLISM IN HEPATIC DISORDERS. (*E.*) Daimon, S. (Kyoto U. Sch. Med., Japan). *Jap J Nucl Med* 6(4):415-416, 1969.

3588 HISTOLOGIC CLASSIFICATION OF LIVER-CELL CARCINOMA IN INFANCY AND CHILDHOOD AND IT CLINICAL EVALUATION: A STUDY OF 70 CASES COLLECTED IN JAPAN. (*E.*) Kasai, M. (Tohoku U. Sch. Med., Sendai, Japan) and I. Watanabe. *Cancer* 25(3):551-563, 1970.

3589 MASSIVE EXCHANGE TRANSFUSIONS IN HEPATIC COMA WITH RECOVERY. (*E.*) Gelfand, M. L. (New York, N. Y.), L. Sussman, R. Lavarias and C. Florita. *Amer J Dig Dis* 15(4):373-382, 1970.

3590 CHANGES IN THE NUCLEOTIDE COMPOSITIONS OF NUCLEOLAR 45 S RNA OF AZO DYE-INDUCED HEPATOMA. (*E.*) Matsuhisa, T. (Osaka U. Med. Sch., Japan), K. Higashi, S. Gotoh and Y. Sakamoto. *Canc Res* 30(1):162-166, 1970.

- P:Morph (3042) (3046) (3068)
- P:Secr:Hepatobil (3208) (3213) (3221)
- Diagproc (3260) (3261) (3263) (3268) (3280) (3284) (3297) (3299) (3300) (3301) (3302)
- D:Esoph (3314)
- D:Gen (3703) (3733)
- D:Gen:Parasit (3767) (3787)

LIVER AND BILIARY TRACT

Acute Nonviral Hepatitis and Hepatic Injury

FATAL MASSIVE NECROSIS OF THE LIVER AFTER REPEATED EXPOSURE TO METHOXYFLURANE. *(E.)* anini, M. (St. Elizabeth Hosp., Danville, Ill.), erland and E. P. Kosyak. *Anesthesiology* 32(4): -378, 1970.

pathology of a case of fatal massive necrosis of liver following a second administration of meth- lurane (Penthrane) is discussed on the basis of case report and postmortem findings. Anatomic histologic diagnosis was acute massive necrosis multiple hemorrhages related to acute hepatic ure and acute pulmonary edema, with infection, gestive heart failure and shock as well as acute ctious hepatitis ruled out. In parallel to a anism of sensitization responsible for acute atic damage following repeated use of halothane, imilar mechanism may be responsible for the necro- produced by methoxyflurane.

2 ELECTRON-MICROSCOPIC INVESTIGATION OF THE HEPATOTOXIC EFFECTS FOLLOWING THF EATED USE OF VARIOUS INHALATION ANESTHETIC NTS. *(E.)* Inamoto, A. (Kyoto U. Hosp., Japan), Okamoto and Y. Matsuo. *Progress in Anesthesi- gy: Proceedings of the Fourth World Congress of sthesiologists* 913-918, 1968.

lt inbred mice and albino rabbits were exposed repeated doses of inhalation anesthetics (diethyl er, cyclopropane, halothane, methoxyflurane and oroform) and liver specimens were taken by psy after anesthesia on the third day, on the enth day and one week after recovery and pre- ed for electron-microscopic and histopathologic mination. Diethyl ether (4%) and cyclopropane %) were almost harmless to the liver cell, even repeated anesthesia was given for one week and not reach the clinical level. Halothane (1%) methoxyflurane (0.5%) were non-toxic when used h sufficient oxygen but dilation of the endo- smic reticulum by halothane and methoxyflurane gest transient disturbances in utilization of oprotein by the liver cell. Chloroform (0.7%) definitely hepatotoxic, even if given with a h oxygen concentration, and was most destructive hepatocytes under hypoxic conditions.

3 HALOTHANE AND LIVER DAMAGE. *(E.)* Skulberg, A. (Ulleval Hosp., Oslo, Norway), G. K. M. ressen and I. Lund. *J Oslo City Hosp* 20(1): 6, 1970.

idence of liver damage caused by halothane sthesia was investigated by retrospective liter- re searching and clinical observation in 8 gical patients. Incidence of acute parenchym- us liver damage following halothane compared to er general anesthetics is as follows: Slater al (1964), 1:4895 (halothane), 1:4605 (other sthetics); Dykes et al (1965), 1:1836 (halothane), 224 (other anesthetics); and National Halothane dy, 0.88:10,000 (halothane), 0.73:10,000 (other sthetics). Retrospective data and observation 8 surgical patients indicate that hepatic mage due to halothane seemingly is an allergic relation with low incidence (four surgical patients with previous halothane anesthesia) and the condition is often accompanied by fever, chills, rash, arthralgia, and eosinophilia, with damage occurring most frequently after multiple halothane administrations. Before halothane anesthesia is employed, patients should be questioned about possible previous jaundice attacks and their relation to operation and anesthesia. Unexplainable temperature increase and/or jaundice following halothane administration should discourage use of this anesthetic.

3594 INTRAVASCULAR COAGULATION IN ACUTE HEPATIC NECROSIS. *(E.)* Rake, M. O. (King's Coll. Hosp., London, England), P. T. Flute, G. Pannell and R. Williams. *Lancet* 1(7646):533-537, 1970.

Tests for coagulation and fibrinolysis, the intravascular survival of ^{125}I-labeled fibrinogen, and the influence of different forms of therapy were studied in thirteen patients with acute hepatic necrosis. In all patients, there was evidence of abnormalities in red-blood-cell morphology, with target cells, mild pincytosis and occasional nucleated red blood cells. Two patients had fragmented red blood cells with polychromasia and signs of microangiopathic hemolytic anemia. In all patients prothrombin times and partial thromboplastin times were prolonged, plasminogen levels were low (below 2 casein units per ml), and fibrinolysis was increased as reflected by the abnormally rapid fall of circulating radioactivity of labeled fibrinogen. The half-life of fibrinogen in 6 patients with hepatic necrosis (range: 28-45 hr) was consistently less than that of 5 patients with compensated cirrhosis (range: 63-95 hrs) whose values fell within the normal range. Severe necrosis of liver cells apparently causes increased intravascular coagulation.

3595 A POSSIBLE PATHWAY FOR ETHANOL-INDUCED FATTY LIVER AND MODIFICATION OF LIVER INJURY BY ANTIOXIDANTS. *(E.)* Pennington, S. N. (Cancer Res. Ctr., Columbia, Mo.), S. K. Chattopadhyay and H. D. Brown. *Quart J Stud Alcohol* 31(1):13-19, 1970.

The interaction of cytochrome P-450 (of the mixed-function oxidase system) with ethanol metabolism and role of an antioxidant in this sytem were studied in isolated microsomes from calf or rat livers. Amount of NADPH or $Na_2S_2O_4$ necessary to reduce totally the available P-450 was approximately 0.5-0.6 mg/3 ml. When various concentrations of ethanol were added to P-450 content of 105,000 x g fraction, ethanol had only a small effect on P-450 content and the observed effect was attributed to acetaldyhyde formation. The addition of acetaldehyde had a marked inhibitory effect on P-450 concentration and α-tocopherol acetate effectively inhibited the decrease in P-450 content induced by acetaldehyde addition. Since P-450 content was decreased, mechanism suggested for effect of mixed-function oxidase system in fatty liver development is one whereby mixed-function oxidation fails to metabolize fatty acids which it would ordinarily handle by ω-hydroxylation and this mechanism is inhibited due to ethanol ingestion, i.e., the formation of acetaldehyde which oxidizes reduced P-450.

3596 ORGANELLE PATHOLOGY OF THE LIVER: THE ENDOPLASMIC RETICULUM. *(E.)* Stenger, R. J. (New York Med. Coll., New York). *Gastroenterology* 58(4):554-574, 1970.

3597 SEVERE ICTERUS CAUSED BY ACUTE HEPATIC NECROSIS. *(Fr.)* Opolon, P. (no affil), Y. Hecht, G. Theodoropoulos, P. Hadchouel, A. Grynblat and J. Caroli. *Rev Med Chir Foie* 44(6):251-290, 1969.

3598 HISTOLOGICAL ASPECTS OF SEVERE ACUTE CYTOLYTIC HEPATITIS: RESULTS OF LIVER BIOPSY. *(Fr.)* Paliard, P. (Hosp. Edward Herriot, Lyon, France), J. Motin, C. Grimaud and M. Cuche. *Rev Int Hepat* 19(5):261-271, 1969.

3599 SEVERE METHYL ALCOHOL POISONING (A CASE REPORT). *(E.)* Singh, S. V. (R. N. T. Med. Coll., Udaipur, Rajasthan, India), D. R. Shah, O. P. Kulshrestha, S. Mendiratta and I. L. Jain. *Indian J Med Sci* 23(12):661-664, 1969.

3600 EFFECT OF INGESTED MONURON ON THE LIVER. *(Rus.)* Rubenchik, B. L. (Kiev Inst. Nutr. Hyg., USSR), A. S. Petrun, M. B. Pliss and G. P. Shipko. *Vop Pitan* 28(6):13-18, 1969.

3601 CLINICAL FINDINGS IN PATIENTS WITH HEPATITIS AND ABNORMAL BILE DUCT EPITHELIUM. *(E.)* Christoffersen, P. (Commun. Hosp., Copenhagen, Denmark), H. Poulsen and K. Winkler. *Scand J Gastroent* 5(2):117-121, 1970.

3602 HALOGEN SENSITIZATION OF THE LIVER: A CLINICAL SYNDROME WITH TWO CASE REPORTS. *(E.)* Keown, K. K. (U. Missouri Med. Ctr., Columbia) and H. G. Bingham. *Anest Analg* 48(5):710-714, 1969.

3603 EFFECT OF HALOTHANE IN THE LIVER OF DOGS: EXPERIMENTAL HISTOCHEMICAL AND HISTOLOGIC STUDY WITH AN ELECTRON MICROSCOPE. *(Sp.)* Trevino Garcia Manzo, N. (Natl. Med. Ctr., Mexico), R. Muzquiz Soberon, J. Aguirre Garcia and M. Guerro Alcazar. *Prensa Med Mexicana* 34(9-10):324-330, 1969.

3604 THE LYMPHOCYTE SYSTEM IN ACUTE AND CHRONIC HEPATITIS. *(It.)* Ascione, A. (Phthisology Clin. U. Rome, Italy). *Epatologia* 15(1):17-75, 1969.

3605 BACTERIOLOGY OF PERIHEPATIC AND INTRAHEPATIC ABSCESS. *(E.)* Gillespie, W. A. (U. Bristol Med. Sch., England). *Proc Roy Soc Med* 63(3):322-323, 1970.

3606 HEPATIC VEIN THROMBOSIS: INCREASED INCIDENCE IN RATS GIVEN METHYLCHOLANTHRE AND CARBON TETRACHLORIDE. *(E.)* Reuber, M. D. (Nat Cancer Inst., Natl. Inst. Hlth., Bethesda, Md.). *Arch Environ Hlth* 20(4):458-461, 1970.

3607 ENHANCEMENT AND SUPPRESSION OF HEPATOTOXICITY OF CHLOROFORM BY DRUGS. *(Ger.)* Scholler, K. L. (Surg. U. Clin., Freiburg, Germany E. Muller and U. Von Plehwe. *Arzneimittelforschun* 20(2):289-291, 1970.

3608 STUDIES ON FRUCTOSE PHOSPHATE ALDOLASE I EXPERIMENTAL LIVER DAMAGE IN RATS: III. LIVER DAMAGE BY CARBON TETRACHLORIDE. *(Ger.)* Dikow, A. L. (Oncol. Invest. Inst. Sofia, Bulgaria) and D. Hadjiolov. *Z Klin Chem Klin Biochem* 8(1):35-37, 1970.

3609 IMPORTANCE OF SOME AMINOACIDS IN HEPATIC DETOXIFICATION PROCESSES. *(It.)* Pellegrini, R. (Alexander Fleming Res. Inst., Mila Italy) and P. A. Vertova. *Gazz Med Ital* 128(10):602-605, 1969.

3610 INFLUENCE OF AMMONIUM INTOXICATION AND ACUTE LIVER DAMAGE ON BRAIN GAMMA AMINOBUTYRIC ACID IN RATS. *(Sp.)* Ugarte, G. (Fac. Med. U. Chile, Valparaiso), T. Peneda and A. Vallega. *Arch Biol Med Exp* 5(1-2-3):1-3, 1968.

3611 PREVENTION BY ETHYL ALCOHOL OF HEPATIC LESIONS INDUCED BY ALLYL FORMATE. *(E.)* Schwarzmann, V. (I. N. S. E. R. M. Paris, France), R. Infante, D. Petit and N. Berthaux. *Rev Franc Etud Clin Biol* 14(10):1014-1017, 1969.

3612 HALOTHANE AND LIVER FAILURE. *(E.)* Aach, R. (Washington U. Sch. Med., St. Louis, Mo.). *JAMA* 211(13):2145-2147, 1970.

3613 HETEROLOGOUS BOVINE LIVER PERFUSION THERAPY OF ACUTE HEPATIC FAILURE. *(E.)* Condon, R. E. (U. Illinois Coll. Med., Chicago), C. T. N. Bombeck and F. Steigmann. *Amer J Surg* 119(2):147-154, 1970.

3614 RADIOLOGY IN DIAGNOSIS AND CONTROL OF SURGICAL TREATMENT OF SUBPHRENIC AND LIVER ABSCESSES. *(E.)* Harley, H. R. S. (Sully Hosp Penarth, Glamorgan, Scotland). *Proc Roy Soc Med* 63(3):319-322, 1970.

5 ON THE UNIMPARABLE RESISTANCE OF THE GUINEA PIG TO DIETARY AMINO AZO DYE ATOCARCINOGENESIS. *(E.)* Gosch, H. H. (U. higan Med. Sch., Ann Arbor), J. C. Arcos and F. Argus. *Z Krebsforsch* 73(3):215-217, 1970.

6 THE ANABOLIC EFFECTS OF ESTROGENS ON MOUSE-LIVER AND THEIR INHIBITION BY MIPHENE. *(E.)* Schwarzlose, W. (Inst. Pharmacol., Erlangen-Nuremberg, Germany) and F. Heim. *chem Pharmacol* 19(1):23-26, 1970.

7 β-GLUCURONIDASE ACTIVITY IN THE SERUM AND LIVER OF RATS TREATED WITH PARATHION. *(E.)* liams, C. H. (Div. Pharmacol. Toxicol., FDA, hington, D. C.). *Toxicol Appl Pharmacol* 16(2): -539, 1970.

8 ACUTE ALCOHOLIC HYPOGLYCEMIA IN TWO 4-YEAR-OLDS. *(E.)* Heggarty, H. J. rthern Gen. Hosp., Sheffield, England). *Brit J* 1(5691):280, 1970.

9 COMPARATIVE MORPHOLOGIC AND FUNCTIONAL STUDIES OF NEPTUNIUM-INDUCED FATTY LIVERS RATS. *(E.)* Berlin, J. D. (Battelle Mem. Inst., hland, Wash.) and D. D. Mahlum. *Lab Invest* 3):252-259, 1970.

20 POLYRIBOSOME DISAGGREGATION IN RAT LIVER FOLLOWING ADMINISTRATION OF TANNIC ACID. *)* Reddy, J. K. (U. Kansas Med. Ctr., Kansas City), Chiga, C. C. Harris and D. J. Svoboda. *Cancer* 30(1):58-65, 1970.

3621 SELECTED ENZYMES OF PYRIMIDINE NUCLEOTIDE METABOLISM IN LIVERS FROM RATS FED α-NAPHTHYLISOTHIOCYANATE. *(E.)* Sneider, T. W. (Med. Sch. U. Wisconsin, Madison), E. L. Krawitt and V. R. Potter. *Cancer Res* 30(1):44-47, 1970.

3622 HISTOCHEMICAL STUDIES ON THE ACTION OF AFLATOXINS: I. A CYTOLOGICAL AND CYTOCHEMICAL STUDY OF THE LIVER OF RATS FED A DIET CONTAMINATED WITH *ASPERGILLUS FLAVUS*. *(E.)* Mietkiewski, K. (Med. Acad. Poznan, Poland), J. Janicki, L. Malendowicz, M. Urbanowicz and B. Filipiak. *Folia Histochem Cytochem* 7(4):379-406, 1969.

3623 LIVER CHANGES RESEMBLING THOSE SEEN IN ACUTE PHOSPHORUS POISONING IN A PATIENT RECEIVING CYTOTOXIC DRUGS. *(E.)* Cochran, A. J. (Western Inf. Glasgow, Scotland) and A. A. Watson. *Med Sci Law* 9(3):202-204, 1969.

- P:Morph (3058) (3081) (3083)
- P:Secr:Hepatobil (3167) (3211)
- D:L.Intest (3494)
- D:Livbil (3543)
- D:Gen:Parasit (3782)

LIVER AND BILIARY TRACT

Acute Viral Hepatitis

24 VIRUS-LIKE PARTICLES IN SERUM OF PATIENTS WITH AUSTRALIA-ANTIGEN-ASSOCIATED HEPATI- . *(E.)* Dane, D. S. (Middlesex Hosp., London, land), C. H. Cameron and M. Briggs. *Lancet 1* 49):695-698, 1970.

um samples from 16 hepatitis patients positive Australia-antigen by the agar-gel diffusion test re examined by immune electron microscopy using gative-staining techniques. The small round forms Australia-antigen were present in all samples and long forms in some samples while in the sera m 3 patients, there were also a few larger forms proximately 42 mμ in diameter, and when these were netrated by negative stain a complex structure was vealed. The large particles were often seen in clumps with the small and long forms suggesting that they had been aggregated by the antiserum which had been added before centrifugation. These particles may be complete hepatitis virus and the much more numerous 22 nm particles and long forms of Australia-antigen may be surplus virus-coat material.

3625 STUDIES OF AUSTRALIA-SH ANTIGEN IN SPORADIC VIRAL HEPATITIS IN LONDON. *(E.)* Cossart, Y. E. (Virus Reference Lab., London, England) and J. Vahrman. *Brit Med J* 1(5693):403-405, 1970.

Sera from 87 patients with acute sporadic viral hepatitis were tested for presence of the Australian-SH antigen (Au-SH antigen). Of the sera, (first specimen) 51% were negative, 27% were positive by both gel-diffusion, and complement-fixation test, and 22% were positive by complement-fixation test only. Sera with high titers in the complement-fixation test generally reacted positively in the gel-diffusion test, 90% of those producing lines in gel-diffusion test having titers 1/64 or higher, compared with 30% of those which did not. There were, however, 4 cases of high titers in the complement-fixation test which failed to react in the gel-diffusion test. Following testing of a second serum specimen from 13 patients with previous serum antigen, 11 were found negative in the gel-diffusion test, but 9 still contained antigen detectable by complement fixation. There was no correlation between time after onset, return of serum transaminase to normal, and loss of antigen from serum. When patients were divided into clinical categories of infectious hepatitis, serum hepatitis or undetermined (both types), 30% were positive by both gel-diffusion and complement-fixation tests, 20% were positive by complement-fixation alone, and 50% were negative. Cases divided into Au-SH antigen-positive and antigen-negative groups showed that antigen-positive group contained more males than females (4.5 to 1), while antigen-negative were similar (1 to 1). Serum aspartate aminotransferase levels remained raised longer with more fluctuation in the antigen-positive patients. Antigen-positive and antigen-negative hepatitis seemingly may be two distinct clinical entities and that subdivision into these types may be more realistic clinically and epidemiologically than division of viral hepatitis into infectious and serum types.

3626 EXPERIMENTAL ACUTE AND CHRONIC VIRAL HEPATITIS: EFFECT OF ANTITHYMOCYTE GLOBULIN. *(E.)* Gitnick, G. L. (Mayo Clin., Rochester, Minn.), R. G. Shorter and L. J. Schoenfeld. *Gastroenterology* 58(4):516-523, 1970.

The effect of rabbit antimouse thymocyte globulin was studied in mice with experimental acute viral hepatitis due to reovirus type 3 or murine hepatitis virus type 3 infection. Antithymocyte globulin significantly increased the mortality of these mice and in other experiments in converted a subclinical hepatitis to an overt illness with significant mortality. The clinical course of experimental chronic hepatitis induced by reovirus type 3 was not influenced by the administration of antithymocyte globulin. Bilirubinuria was detected throughout the acute and chronic phases both in antithymocyte globulin-treated and untreated mice. The livers of mice receiving antithymocyte globulin during acute hepatitis showed more extensive hepatocellular necrosis and mononuclear cell infiltration than those receiving virus without antithymocyte globulin while in chronic hepatitis, the degree of hepatocellular necrosis and inflammatory reaction in the livers of mice was not altered by antithymocyte globulin. Fibrosis, but not cirrhosis, was found in the chronic phase of viral hepatitis and viral isolation attempts were successful throughout the acute phase but not in the chronic phase. Complement-fixation, immunodiffusion, and immunoelectrophoretic techniques failed to demonstrate evidence of circulating antiliver antibody in the sera of mice having chronic hepatitis.

3627 HEPATITIS AND APLASTIC ANEMIA. *(Dut.)* Timmermans, U. (Milit. Hosp. Antwerp, Belgium) and P. Waumans. *Nederl T Geneesk* 114(7): 286-290, 1970.

3628 SERUM HEPATITIS IN THE GREATER NEW ORLEAN AREA. *(E.)* Larson, D. L. (Louisiana St. Med. Sch., New Orleans), J. Blondin, M. B. Seshul, R. J. Campeau and F. A. LcCour. *J Louisiana Med Soc* 122(3):69-76, 1970.

3629 AUSTRALIA ANTIGEN AND HEPATITIS. *(E.)* anonymous. *Brit Med J* 1(5691):247-248, 1970.

3630 PREGNANCY IN INFECTIVE HEPATITIS AND CONTROL EXAMINATIONS OF NEWBORN INFANTS. *(Ser.)* Perisic, Z. (Sch. Med. Beograd, Yugoslavia) N. Lah and V. Ilic. *Srpski Arh Celok Lek* 97(6): 617-623, 1969.

3631 EPIDEMIOLOGY AND CYTOLOGY IN THE DETECTIO OF VIRAL HEPATITIS CARRIERS AMOUNG BLOOD DONORS. (*Rus.*) Belikova, V. P. (Ivanovsky Virol. Inst., Acad. Med. Nauk, USSR, Podolsk, Ukraine), I. F. Barinsky, I. V. Dementiev and E. P. Filatov. *Zh Mikrobiol* 46(12):43-50, 1969.

3632 ADAPTATION TO INFECTIOUS DISEASE: AUSTRA IA ANTIGEN AND HEPATITIS. *(E.)* Blumberg, B. S. (Inst. Cancer Res., Philadelphia, Pa.). *Amer J Phys Anthrop* 32(2):305-308, 1970.

3633 SERUM CHOLINESTERASE IN INFECTIVE HEPATITIS AND HEPATIC COMA. *(E.)* Achari, A. N. (Darbhanga Med. Coll. Laheriasarai, India) and S. M Ghose. *J Indian Med Ass* 54(1):1-5, 1970.

3634 DOWN'S SYNDROME AND INFECTIOUS HEPATITIS. *(E.)* Kucera, J. (Teratology Unit, U. P. M. D., Prague, Czechoslovakia). *Lancet* 1(764 569-570, 1970.

3635 SOME PROBLEMS OF VIRAL HEPATITIS. *(E.)* Sherlock, S. (Roy. Free Hosp., London, England). *Practitioner* 204(1220);271-272, 1970.

3636 DISACCHARIDASE CONTENT IN THE SMALL-INTESTINAL MUCOSA OF NORMAL MOUSE AND OF MOUSE WITH VIRAL MHV-3 HEPATITIS. *(E.)* Filosa, E. (Clin. Infect. Dis. U. Naples), G. G. Balestrieri, G. Ruggiero and F. Piccinino. *Enzym Biol Clin* 11(3):231-236, 1970.

537 STUDY OF LIPID DIGESTION IN PATIENTS WITH VIRAL HEPATITIS. *(E.)* Modai, M. (Tel-ashomer Hosp., Tel-Aviv, Israel) and E. Theodor. *roc Tel-Hashomer Hosp* 8(2-3):48-49, 1969.

638 SOME OBSERVATIONS ON AN OUTBREAK OF INFECTIOUS HEPATITIS OCCURING IN A LARGE RIMARY SCHOOL. *(E.)* Rogers, P. S. (Coburg, Vic-oria, Australia) and F. Ford. *Med J Aust* 57(7): 16-319, 1970.

639 APPLICATION OF PREVENTITIVE HEALTH MEASURES TO CURTAIL CHIMPANZEE- ASSOCI-TED INFECTIOUS HEPATITIS IN HANDLERS. *(E.)* Krushak, . H. (Natl. Communicable Dis. Ctr., Phoenix, Ariz.). *ab Anim Care* 20(1):52-56, 1970.

3640 HEPATITIS IN MARMOSETS. *(E.)* Deinhardt, F. (Presbyterian-St. Luke;s Hosp., Chicago, Ill.), A. W. Holmes and L. G. Wolfe. (With response from Melnick, J. L. (Baylor Coll. Med., Houston, Texas) and W. P. Parks.) *J Infect Dis* 121(3):351-354, 1970.

- P:Morph (3084)
- D:Livbil:C.Hep (3604) (3642)
- D:Livbil:Cirrh (3648)

LIVER AND BILIARY TRACT

Chronic Hepatitis

3641 AUSTRALIA ANTIGEN IN CHRONIC HEPATITIS IN AUSTRALIA. *(E.)* Mathews, J. D. (Roy. Ielbourne Hosp., Australia) and I. R. Mackay. *Brit Ied J* 1(5691):259-261, 1970.

iera from patients with lupoid hepatitis, active :hronic hepatitis, and other hepatic and autoimmune liseases were tested for australian antigen (Au(1)). intibody to Au(1) was found in 2 of 102 patients vho had received numerous transfusions while the sera of two out of 53 patients with active chronic and lupoid hepatitis and 7 out of 20 patients with :linically atypical acute hepatitis were positive for Au(1). Au(1) was not found in 20 typical cases of infectious hepatitis in young people and in 86 patients with other diseases. Au(1)-positive cases of chronic hepatitis seemingly come from a subpopulation of older patients and active chronic hepatitis may be attributable to initial infection with or breakdown of immunological tolerance to Au(1)-positive (long-incubation-period) hepatitis virus; in younger patients, active chronic hepatitis may follow infection with Au(1)-negative (short-incubation-period) hepatitis virus which has not yet been determined serologically.

3642 PRESENCE OF PARTICLES OTHER THAN THE AUSTRALIA-SH ANTIGEN IN A CASE OF CHRONIC ACTIVE HEPATITIS WITH CIRRHOSIS. *(E.)* Zuckerman, A. J. (London Sch. Hyg. Trop. Med., England), P. E. Taylor and J. D. Almeida. *Brit Med J* 1(5691): 262-264, 1970.

Examination of serum specimens from a middle-aged man with chronic active hepatitis and cirrhosis proved negative for Australian-SH antigen by immunodiffusion and complement fixation. Serum samples (complete fixation) showed anticomplementary activity up to and at a 1:8 dilution and subsequent electron microscopy revealed virus-like structures similar to coronovirus group (a mouse hepatitis virus was found to belong to the same coronovirus group). Serum samples containing MS-1 agent (infectious hepatitis variety) was found negative for Australia-SH antigen when tested by immunodiffusion, complement fixation, and electron microscopy. Antibody response seemingly is due to a hitherto undescribed human virus generically related to mouse hepatitis viruses (human counterpart with serological relationship). Negative findings with MS-1 pool indicate possible immunological differences between serum hepatitis and infectious hepatitis.

3643 METABOLISM OF ^{131}I GAMMA GLOBULINS IN PATIENTS WITH CHRONIC LIVER DISEASE. *(E.)* Hirayama, C. (Fac. Med. Kyushu U., Fukuoka, Japan), T. Fukuda and T. Toda. *Clin Chem Acta* 27(3): 409-413, 1970.

The metabolism of ^{131}I-labeled γ-globulins (γG, γA, γM) (50-100 μC, i.v.) was studied by scintillation counting in 17 patients with chronic nonalcoholic liver disease (chronic hepatitis and cirrhosis) and 15 normal subjects. Patients with chronic active hepatitis and liver cirrhosis showed a significant decrease in half-life of γG (9.4 ± 2.0 and 10.1 ± 1.7 days resp, compared to 14.1 ± 2.7 days for controls) and a significant increase in the synthesis rate (102 ± 29 mg/kg/day and 123 ± 25 mg/kg/day resp, compared to 52 ± 5 mg/kg/day for controls). Following treatment with 20-30 mg of prednisolone (daily, 3-4 weeks), the synthesis rate decreased significantly in patients with liver cirrhosis (70 ± 10 mg/kg/day compared to 52.5

mg/kg/day for controls); no significant change occurred in chronic active hepatitis. Serum concentrations of γA (7.5 ± 2.1 mg/ml) and γM (2.8 ± 0.7 mg/ml) in liver cirrhosis patients were significantly increased compared to controls (2.9 ± 1.0 mg/ml and 0.9 ± 0.1 mg/ml, resp.). Synthetic rate of γA increased in all liver cirrhosis patients (108 ± 52 mg/kg/day compared to 29.4 ± 4 mg/kg/day in controls), while the synthetic rate of γM was increased in liver cirrhosis patients (19 ± 5.6 mg/kg/day compared to 6 ± 0.6 mg/kg/day in controls); significant prolongation of half-life (8.0 ± 0.7 days compared to 6.0 ± 0.7 days for controls) was observed with γM. Concentrations of serum γG seemingly are regulated by a feedback control mechanism and increased synthesis of γA and γM are apparently the major contributing factors to their elevated serum levels.

3644 THE DETERMINATION OF THE α_2-GLOBULIN CONCENTRATION IN PROTRACTED AND CHRONIC FORMS OF INFECTIOUS HEPATITIS. *(Rus.)* Safonova, L. G. (Lugan Med. Inst. USSR) and R. P. Dorofeeva. *Ter Arkh* 41(12):46-49, 1969.

3645 LIPID METABOLISM IN PATIENTS WITH CHRONIC POSTINFECTIOUS HEPATITIS TREATED BY USING FAT ENRICHED DIETS. *(Rus.)* Sadyk-Zade, K. S. (Inst. Nutr., Acad. Med. Nauk, USSR, Moscow). *Vop Pitan* 28(6):41-44, 1969.

3646 DUBIN-JOHNSON SYNDROME. *(E.)* Muhammad, S. (Med. Sch. U. Indonesia, Jakarta) and S. Darmawan. *Paediat Indonesia* 9(6):280-285, 1969.

3647 WIDESPREAD ARTERIAL SPIDERS IN A CASE OF LATENT HEPATITIS, WITH RESOLUTION AFTER THERAPY. *(E.)* Whiting, D. A. (Johannesburg, S. Africa), J. C. Kallmeyer and I. W. Simpson. *Brit J Derm* 82(1):32-36, 1970.

- D:Livbil:A.Nonv.Hep (3604)
- D:Livbil:A.V.Hep (3626)

LIVER AND BILIARY TRACT

Cirrhosis

3648 IMMUNOLOGICAL PICTURE IN INDIAN CHILDHOOD CIRRHOSIS. *(E.)* Chandra, R. K. (All India Inst. Med. Sci., New Delhi). *Lancet* 1(7646): 537-540, 1970.

Serum transaminases (SGOT, SGPT), immunoglobulins (IgG, IgA and IgM) and complement component (β_{1c}) were determined in 30 healthy children and 30 patients with Indian childhood cirrhosis, 6 with acute viral hepatitis, 5 with extrahepatic biliary atresia, 6 with fatty liver and 5 with thalassemia. Values for SGOT and SGPT, IgG, IgA and IgM, and β_{1c} in normal children were 0.80 μmole/ml/hr and 0.95 μmole/ml/hr, 117%, 85% and 144%, and 103%, resp. Serum IgG, IgA and IgM levels were significantly increased in patients with Indian childhood cirrhosis and acute viral hepatitis with the greatest increase occurring in IgM levels. Serum β_{1c} levels were markedly decreased in all patients and in 22/30 patients with Indian childhood cirrhosis, a qualitatively different complement component was detected by immunoelectrophoresis. Hepatitis-associated antigen was detected in the serum of 6/30 patients with Indian childhood cirrhosis and the presence of this antigen was not specifically related to the levels of serum immunoglobulins, transaminases or complement or the clinical grading of the severity of hepatic damage. Hepatitis-associated antigen was also detected in the serum of 4/6 children with acute viral hepatitis. Smooth muscle antibodies were detected in 9/11 sera test from patients with Indian childhood cirrhosis and in two patients, these antibodies were present in dilutions up to 1/20 using both anti-IgG and anti-IgM conjugates Indian childhood cirrhosis may constitute an infection with a hepatitis-associated antigen in early life in a genetically-disposed infant, resulting in liver cell damage possibly perpetuated by secondary immunological mechanisms.

3649 LIVER IN FELTY'S SYNDROME. *(E.)* Blendis, L. M. (King's Coll. Hosp. Med. Sch., London, England), I. D. Ansell, K. L. Jones, E. Hamilton and R. Williams. *Brit Med J* 1(5689):131-135, 1970.

Liver function, histology, and hematological changes were studied in 12 patients with Felty's syndrome.

ll patients demonstrated neutropenia during ill-
ess (less than 2,000/cu mm), 2 patients had a plate-
et count below 100,000/cu mm (neither of them suf-
ering from purpura) and 6 patients were anemic,
ith hemoglobin concentrations of 7 to 11 g/100 ml.
otal red cell mass in 6 anemic patients was either
ormal or in one patient, increased at 35.8 ml/kg
normal range 22 to 34 ml/kg). In 5 of these pa-
ients, anemia was due to increased plasma volume
rom 61.8 to 111.1 ml/kg (normal range 34 to 48 ml/
g) and eventual red cell mass dilution. Two pa-
ients had increased hemolysis (hemoglobin dropped
rom 12 to 9.4 g/100 ml) associated with red cell
equestration by enlarged spleens. Eight out of 12
atients showed abnormal liver function tests while
n 5 patients, liver histology showed lymphocytic
nfiltration of sinusoids and portal tracts together
ith portal tract cirrhosis. Macronodular cirrhosis
as eventually found in one of these patients, while
nother patient showed nodules without true cirrho-
is (observed in 2 additional patients with Felty's
yndrome). Increased splenic blood flow was present
n 2 patients with values of 712 and 1060 ml/min
normal range 100 to 300 ml/min).

650 TRANSFER OF MEDIUM CHAIN FATTY ACIDS FROM
BLOOD TO SPINAL FLUID IN PATIENTS WITH
IRRHOSIS. *(E.)* Linscheer, W. G. (Lemuel Shattuck
osp., Boston, Mass.), A. L. Blum and R. R. Platt.
astroenterology 58(4):509-515, 1970.

. test meal of medium chain triglycerides (C6-C12;
.5 g/kg p.o.) was administered to 12 patients with
dvanced alcoholic cirrhosis and to 12 noncirrhotic
ontrol subjects and the concentration of medium
hain fatty acids in serum, serum ultrafiltrates,
nd spinal fluid were measured. Serum octanoic acid
oncentrations were 2 times higher in the cirrhotic
atients than in the control subjects due to its
mpaired clearance from the portal venous circulation.
pinal fluid octanoic acid levels were 4 to 5 times
igher in the cirrhotic patients as compared with
he controls. Serum ultrafiltrates of cirrhotic
atients demonstrated decreased protein binding of
ctanoic acid in serum at higher levels of serum
ctanoic acid than in control subjects. *In vitro*,
pinal fluid concentrations were approximated from
he serum octanoic acid concentrations. A passive
iffusion of octanoic acid into the cerebrospinal
luid probably occurs in advanced alcoholic cirrho-
ics.

651 EFFECTS OF DOPAMINE ON RENAL FUNCTION IN
PATIENTS WITH CIRRHOSIS. *(E.)* Barnardo,
. E. (Mayo Clin., Rochester, Minn.), W. P. Baldus
nd F. T. Maher. *Gastroenterology* 58(4):524-531,
970.

he effects of dopamine (mean dose of 1.9 µg/kg/min
or 179 min, i.v.) on renal function were studied in
0 patients with cirrhosis and various degrees of
mpairment of renal function. Dopamine caused a
onsistent increase in effective renal plasma flow
ut little change in glomerular filtration rate or
odium and water excretion. Cardiac output was not
ltered by the dopamine injections. The hemodynamic
hange was attributed to a direct effect of dopamine
on the renal vasculature, resulting in a reduction in both preglomerular and postglomerular resistance.

3652 IMMUNE REACTIONS IN CIRRHOTIC PATIENTS: STATISTICAL ANALYSIS OF 106 OBSERVATIONS. *(Fr.)* Nakache, J. P. (Fac. Med. Pitie Salpetriere, France), D. Salmon, F. Gremy, A. Gerbal, J. C. Homberg, Ch. Salmon, H. Rochant, Y. Hecht and J. Caroli. *Rev Europ Etud Clin Biol* 15(1):71-80, 1970.

3653 UNSTABLE HYPERLIPEMIA IN ALCOHOLICS WITH ZIEVE'S SYNDROME: STUDY OF THREE CASES. (*Fr.*) Moretti, G. (Bordeaux, France), J. Staeffen and J. Beylot. *Bordeaux Med* 2(11):2379-2392, 1969.

3654 DENERVATION OF THE COMMON HEPATIC ARTERY IN CIRRHOSIS OF THE LIVER. (*Rus.*) Efimishin, N. S. (Grodninsk Med. Inst., USSR). *Vestn Khir* 102(12):20-23, 1969.

3655 CIRRHOSIS: A GROWING THREAT TO LIFE. (*E.*) Carper, J. (no affil). *Todays Health* 48(2):26-27, 67-68, 1970.

3656 SIGNIFICANCE OF SPLENOMEGALY IN PATIENTS WITH HEPATIC CIRRHOSIS AND BLEEDING ESOPHAGEAL VARICES. (*E.*) Dumont, A. E. (New York U. Sch. Med., New York), E. Amorosi and W. M. Stahl. *Ann Surg* 171(4):522-526, 1970.

3657 EMERGENCY PORTOCAVAL ANASTOMOSIS IN CIRRHOTICS: WITH REFERENCE TO 61 OBSERVATIONS. (*Fr.*) Maillard, J. N. (no affil), P. Capelle, R. Giuli and B. Goyer. *Vie Med* 50(36):4489, 4491, 4493, 4495, 1969.

3658 EFFECTS OF DIENESTROL ON THE THYROXINE BINDING CAPACITY OF ALPHA-GLOBULIN IN HEPATIC CIRRHOSIS. (*Sp.*) Zaninovich, A. (Hosp. Sch. Jose de San Martin, Buenos Aires, Argentina), S. El Tamer, O. Degrossi and H. Gotta. *Medicina* 29(5):355-358, 1969.

3659 BILIARY CIRRHOSIS SECONDARY TO EXTRAPULMONARY PARAGONIMIASIS. (*E.*) Okuda, K. (Kurume U. Sch. Med., Japan), S. Kuratomi, M. Moriyama and A. Mae. *Digestion* 2(6):347-353, 1969.

3660 THE EFFECT OF BENZOBROMARONUM ON GOUT, DIABETES MELLITUS, HYPERLIPEMIA, FATTY LIVER AND HYPERTENSION. (*E.*) Mertz, D. P. (Med. Polyclin. U. Frieburg, Germany), I. Sulzberger and M. Klopfer. *Munchen Med Wschr* 112(6):241-247, 1970.

- D:Livbil (3545) (3546)
- D:Livbil:C.Hep (3643)
- D:Gen (3752)

3661 INDUCTION OF RAT LIVER ALKALINE PHOSPHATASE: THE MECHANISM OF THE SERUM ELEVATION IN BILE DUCT OBSTRUCTION. *(E.)* Kaplan, M. M. (Tufts-New England Med. Ctr., Boston, Mass.) and A. Righetti. *J Clin Invest* 49(3):508-516, 1970.

The mechanism of the elevation in serum alkaline phosphatase activity produced after bile duct obstruction (double ligation) was studied in rats by assaying alkaline phosphatase activity in liver and serum, by measurements of *de novo* protein synthesis, and by identification of alkaline phosphatase isozymes. Within 12 hr after bile duct obstruction, there was a 2.5-fold increase in serum alkaline phosphatase activity (normal value = 0.15 IU/ml) and a 7-fold increase in liver alkaline phosphatase activity (normal value = 1 IU/g) and the increased activity lasted for 5 days. The increase in serum alkaline phosphatase activity was accompanied by the appearance of a new isozyme with the same electrophoretic mobility, Michaelis constants, pH optima and heat of denaturation as liver alkaline phosphatase. Rats with bile duct fistulas excreted into the bile approximately 0.025 IU of alkaline phosphatase/g liver/12 hr and the increase in liver alkaline phosphatase activity resulting from bile duct ligation in these rats was 6.0 IU/g liver. Cyclohexamide, 100 μg/100 g i.m. 1 hr before bile duct ligation, inhibited protein synthesis by 68%, the increase in liver phosphatase activity by 98% and that in serum phosphatase activity by 80%. Cycloheximide did not affect the increase in serum glutamic pyruvic transaminase activity and the decrease in liver activity produced by bile duct ligation. Elevated serum phosphatase activity in bile duct obstruction seemingly originates in the liver and is dependent on *de novo* protein synthesis.

3662 BILE PERITONITIS: AN EXPERIMENTAL AND CLINICAL STUDY. *(E.)* Conn, J. H. (U. Mississippi Sch. Med., Jackson), C. M. Chavez and W. R. Fain. *Amer Surg* 36(4):219-224, 1970.

Bile peritonitis produced by creating an internal biliary fistula resulted in death within 60 hr in 10 of 15 dogs; replacement of circulating plasma volume (dextran, 500 ml over 4 hr period) in 5 of the 10 dogs did not significantly increase longevity. At autopsy the peritoneal fluid of these dogs contained various pathogenic bacteria. When penicillin (1,200,000 U) was given to 5 additional dogs immediately following an internal biliary fistula, there were no deaths and although these animals collected up to 5,000 ml of biliary ascitic fluid, cultures were negative except in 2 dogs. A study of patients with internal biliary fistula showed that they had minimal symptomatology, with large quantities of biliary ascitic fluid and negative bacterial cultures. The difference in response between man and dog might be due to a pre-existing peritoneal bacterial flora in the dog.

3663 ANGIOGRAPHIC FINDINGS IN HYPERPLASTIC CHOLECYSTOSES. *(E.)* Elfving, G. (U. Central Hosp., Helsinki, Finland), H. Myllarniemi and P. Peltokallio. *Ann Chir Gynaec Fenn* 58(4):322-325, 1969.

Eleven hyperplastic cholecystotic gallbladders were examined by the technique of microangiography and the results compared with a gallbladder wall in which nothing abnormal was seen either grossly or microscopically. The veins followed the cystic artery and its branches from the neck of the gallbladder to its fundus, and in all hyperplastic cholecystotic gallbladders and the vasculature was distinctly more profuse and more stratified than in normal controls. Vascularization displaying smaller networks and more numerous rami was typical in the hyperplastic gallbladders. Vascular changes encountered in different hyperplastic cholecystoses seemingly are secondary occurrences since the hyperplastic mucosa which provides the gallbladder with a larger resorption surface naturally requires a correspondingly increased blood supply.

3664 IRON IN HUMAN BILE. *(E.)* Mekel, R. C. P. M. (Natl. Nutr. Res. Inst., Pretoria, South Africa), C. J. Van Der Merwe, E. J. P. De Bruin and C. R. Jansen. *S Afr Med J* 44(3):56-58, 1970.

The excretion in the bile (collected by a T-drain) of a tracer dose of i.v. administered ^{59}Fe was studied in 2 female patients who had undergone bile-duct operations. The results obtained for the two cases were almost identical. Following an initial rapid rise of 59Fe concentration in the bile during the first 60 to 75 min. after injection, a constant level of excretion through the T-drain was 0.0017% and 0.0012%, resp., of the dose administered (21,200 nC and 17,200 nC) in the two cases. About 25 to 33% of the body iron excreted via the gastrointestinal tract apparently comes from the bile and reabsorption of a portion of the biliary iron is probable, although the rate of reabsorption is not known.

3665 HEMOBILIA AND HEMOCHOLECYST DUE TO CHOLECYSTITIS WITHOUT STONES: REPORT OF A CASE. *(E.)* Silvennoinen, E. (U. Central Hosp., Helsinki, Finland) and V. Makela. *Ann Chir Gynaec Fenn* 58(4): 336-338, 1969.

3666 EXPERIMENTAL BILIARY LITHIASIS IN DOGS CAUSED BY A SLOWLY INDUCED STENOSIS OF THE TERMINAL COMMON BILE DUCT. *(It.)* Mattiolo, F. (Inst. Clin. Surg. Gen., Surg. Ther., U. Genoa, Italy) and G. C. Torre. *Pathologica* 61(893-894):17-23, 1969.

3667 THE DECEIVING GALLBLADDER. *(E.)* Ficarra, B. J. (Long Island U., Greenvale, New York). *J Abdom Surg* 12(3):37-40, 1970.

3668 FATAL GASTROINTESTINAL TRACT HEMORRHAGE: A COMPLICATION OF ULCERATIVE CHOLECYSTITIS, CHOLELITHIASIS AND CHOLECYSTODUODENAL FISTULA. *(E.)* Schenken, J. R. (Nebraska Methodist Hosp., Omaha) and J. R. Adamson. *Amer J Clin Path* 53(3):423-424, 1970.

569 CLOSTRIDIAL INFECTION FOLLOWING CHOLECYSTECTOMY. (*Dut.*) Bornhaupt, C. L. (Milit. osp. A. Mathijsen, Utrecht, Netherlands). *Nederl ilit Geneesk T* 22(6):329-333, 1969.

70 PATHOGENESIS OF POSTHEPATIC HYPERBILIRUBINEMIA. FUNCTIONAL AND ULTRASTRUCTURAL TUDIES. (*It.*) Gentilini, P. (Inst. Spl. Path. Med. lin. Method., U. Study, Firenze, Italy), C. urrenti, A. C. Tommasi and R. Camilloni. *Arch Ital al Appar Dig* 35(6):553-562, 1969.

571 SURGICAL TREATMENT OF CHOLELITHIASIS. (*Rus.*) Romanov, P. K. (Dzhanelidze Emerg. es. Inst., Leningrad, USSR) and N. S. Triumfora. *estn Khir* 103(2):14-17, 1970.

572 RADIOISOTOPE SCANNING OF THE LIVER IN DIAGNOSIS OF OBSTRUCTIVE JAUNDICE IN ALVEOCCOSIS. (*Rus.*) Sheffer, R. Ya. (Altai Med. Inst., SSR) and S. L. Pribylovsky. *Vestn Khir* 102(12):17-9, 1969.

573 DUODENAL CATHETERIZATION IN PATIENTS AFTER BILE DUCT SURGERY. (*Rus.*) Makhov, N. I. Vladimirsky Reg. Clin. Res. Inst., Moscow, USSR) and u. A. Travkin. *Vestn Khir* 102(12):23-25, 1969.

674 BIOCHEMICAL BLOOD SERUM PARAMETERS AND LIVER MORPHOLOGICAL DATA IN OBSTRUCTIVE AUNDICE. (*Rus.*) Strutchkov, V. I. (Sechenov Med. nst., Acad. Med. Nauk USSR, Moscow), V. S. Vasiliev, . A. Smoliar and N. K. Bogdanovich. *Ter Arkh* 1(12):40-44, 1969.

675 INTESTINAL ALKALINE PHOSPHATASE IN CHRONIC HEPATO-BILIARY DISEASE. (*Rus.*) Bakhadynov, . B. (Atakhanov Pediat. Inst., Tashkent, USSR), . K. Kakharbekov, E. A. Beiul and Z. F. Cherenok. *er Arkh* 41(12):44-46, 1969.

676 IMPORTANCE OF PUNCTURE BIOPSY OF THE PANCREAS FOR THE ASSESSMENT OF OBSTRUCTIVE AUNDICE. (*Rus.*) Lobko, A. F. (Pirogov Med. Inst., dessa, USSR). *Klin Khir* 52(1):22-26, 1970.

677 SPONTANEOUS BILE DUCT PERFORATION IN AN INFANT. (*E.*) Van De Stadt, F. R. (Groningen U. Surg. Clin., Netherlands). *Arch Chir eerland* 21(4):313-318, 1969.

678 GAS GANGRENE OF THE GALLBLADDER OR GANGRENOUS PNEUMOCHOLECYSTITIS. (*E.*) Lemmens, . A. J. (St. Annadal Hosp., Maastricht, Netherlands) and J. Louyest. *Arch Chir Neerland* 21(4):333-342, 969.

3679 BETA LIPOPROTEINS IN OBSTRUCTIVE JAUNDICE. MEASUREMENT OF 2 IMMUNOLOGICALLY DISTINCTIVE FRACTIONS. (*Fr.*) Burstein, M. (Nat. Ctr. Blood Transfus., Paris, France) and J. Caroli. *Rev Med* 14(1):68-71, 1969.

3680 PAINS OF THE BILIARY TYPE AND HYPERPLASTIC STATES OF THE GALLBLADDER MUCOSA. (*Fr.*) Leonard, P. (157 Brand Whitlock Blvd., Brussells, Belgium). *Acta Gastroent Belg* 32(10):739-760, 1969.

3681 A PATIENT WITH ICTERUS GRAVIDARUM. (*Dut.*) De Bruijne, H. (Milit. Hosp. Dr. A. Mathijsen, Utrecht, Netherlands). *Nederl Milit Geneesk T* 22(6):338-342, 1969.

3682 BENIGN TUMORS OF CHOLECYSTITIS: DESCRIPTION OF CASES OF PAPILLOMA, ADENOMA, AND LIPOMA. (*It.*) Bonandrini, L. (Dept. Gen. Clin. Surg., Surg. Ther., U. Pavia, Italy), E. Mantellini, P. Colombo and L. Scarabelli. *Minerva Chir* 25(4): 297-312, 1970.

3683 POTASSIUM IN THE MANAGEMENT OF CARDIAC EMERGENCIES PRESENTING IN THE POST-OPERATIVE COURSE OF DIGESTIVE SYSTEM (PARTICULARLY BILIARY) SURGERY. (*It.*) Verga, L. (Orzinuovi Hosp., Italy) and A. V. Bo. *Gazz Med Ital* 128(11):630-644, 1970.

3684 PRIMARY MALIGNANT TUMORS OF THE GALLBLADDER: REPORT OF 43 CASES. (*E.*) Tanga, M. R. (Ottawa Gen. Hosp., Ontario, Canada) and J. B. Ewing. *Surgery* 67(3):418-426, 1970.

3685 HISTOCHEMICAL AZO-COUPLING REACTIONS OF THE PIGMENTS OF OBSTRUCTIVE ICTERUS AND OF HEMATOIDIN: II. EFFECT OF BLOCKADE, BLEACHING AND EXTRACTION PROCEDURES ON THE PIGMENTS AND THEIR AZO-DERIVATIVES. (*E.*) Lillie, R. D. (Louisiana State U. Sch. Med., New Orleans) and P. Pizzolato. *J Histochem Cytochem* 18(2):75-79, 1970.

3686 POLYARTERITIS NODOSA OF THE GALLBLADDER. (*E.*) Remigio, P. (Mary Immaculate Hosp. Div. Catholic Med. Ctr., Jamaica, N. Y.) and E. Zaino. *Surgery* 67(3):427-431, 1970.

3687 CONTRACTIONS OF THE GALLBLADDER AND THE FORMATION OF GALLSTONES: III. (*E.*) Hulten, O. (U. Hosp. Uppsala, Sweden). *Acta Chir Scand* 136(1):53-56, 1970.

3688 REMOVAL OF RESIDUAL BILIARY TRACT CALCULI WITHOUT REOPERATION. (*E.*) Mazzariello, R. (Rivadavia, Buenos Aires, Argentina). *Surgery* 67(4): 566-573, 1970.

3689 CHOLECYSTITIS, PANCREATITIS AND PERICARDITIS. (*E.*) Nolin, L. E. (Waterville, Me.) and J. F. Reynolds. *J Maine Med Ass* 61(2):42-43, 1970.

3690 PRIMARY STONE IN COMMON DUCT ASSOCIATED WITH HYPOGENETIC GALLBLADDER: A CASE REPORT. (*E.*) Polak, T. (Mem. Hosp. Southern California, Culver City). *J Abdom Surg* 12(3):41-42, 1970.

3691 POST-TRAUMATIC ACUTE ACALCULOUS CHOLECYSTITIS IN YOUNG MALES. (*E.*) Shaw, R. C. (Brooke Gen. Hosp., Fort Sam Houston, Texas). *Milit Med* 135(3):210-214, 1970.

3692 FILLING DEFECT IN THE DUODENUM DUE TO STONES IN THE BILIARY TRACT. (*E.*) Shahin, N. (Tel-Hashomer Hosp., Tel Aviv, Israel). *Proc Tel-Hashomer Hosp* 8(2-3):53-55, 1969.

3693 A RADIOLOGICALLY DEMONSTRATED FISTULA BETWEEN THE COMMON BILE DUCT AND THE RIGHT RENAL PELVIS. (*E.*) Op Den Orth, J. O. (Princess Irene Hosp., Almelo, Netherlands). *Radiol Clin Biol* 38(4):402-405, 1970.

3694 PATHOPHYSIOLOGY OF CHOLESTASIS. (*E.*) Popper, H. (Mt. Sinai Sch. Med. City U. New York) and F. Schaffner. *Human Path* 1(1):1-24, 1970.

- P:Secr:Hepatobil (3182)
- Diagproc (3264) (3273) (3279) (3295) (3298) (3306) (3310)
- D:Stomduo (3366)
- D:S.Intest (3421)
- D:Livbil:A.Nonv.Hep (3601)

GENERAL

3695 POSTOPERATIVE CHANGES OF ORNITHINE CARBAMOYL TRANSFERASE ACTIVITY IN SERUM (S-OCT) RELATED TO OXYGEN SATURATION IN HEPATIC VEIN BLOOD DURING OPERATIONS IN MAN. (*E.*) Gillquist, J. (Karolinska Hosp., Stockholm, Sweden), L. Kaijser and S. O. Liljedahl. *Acta Chir Scand* 136(1):9-16, 1970.

The relation between variations in oxygen saturation of the hepatic vein blood (S_{O2}) during surgery to postoperative changes in serum ornithine carbamoyl transferase activity (measured as n-moles $^{14}CO_2$/(ml x hr)) was analyzed in 19 patients prior to surgery for fracture of the lower extremity. There was a significant correlation between the early postoperative increase in serum ornithine carbamoyl transferase activity (normal value = <4 n-moles/(ml x hr)) and the low oxygen saturation ($p < 0.001$) of hepatic vein blood during operation. The degree and duration of the fall in oxygen saturation influenced the magnitude of the increase in serum ornithine carbamoyl transferase activity. An early increase in serum ornithine carbamoyl transferase activity seemingly may be caused by ischemia of the liver during operation.

3696 DIARRHEA ASSOCIATED WITH MEDULLARY CARCINOMA OF THE THYROID. (*E.*) Berneir, J. J. (Hosp. St. Lazare, Paris, France), J. C. Rambaud, D. Cattan and A. Frost. *Gut* 10(12):980-985, 1969.

Excessive diarrhea associated with medullary carcinoma of the thyroid is described in 5 patients who were euthyroid and without clinical or laboratory signs of pheochromocytoma. Radiological studies with barium meal revealed hypermotility of the small and large intestine and peroral biopsies showed a normal or mildly impaired (villous atrophy, inflammation) small intestinal mucosa in 3/5 patients. The main components of the excessive diarrhea were water and electrolytes. Steatorrhea was mild or absent and xylose and Schilling tests were normal in the 3 patients with hypermotility. Blood and urine levels of vasoactive excitomotor substances (5-hydroxyindoleacetic acid, serotonin, bradykinin, prostaglandins) and serum albumin and proteins and blood electrolytes, lipids, total cholesterol and hemoglobin were all within normal limits in these patients.

3697 EXPERIENCE WITH CELIAC AXIS COMPRESSION SYNDROME. (*E.*) Edwards, A. J. (St. Bartholomew Hosp., London, England), J. D. Hamilton, W. D. Nichol, G. W. Taylor and A. M. Dawson. *Brit Med J* 1(5692):342-345, 1970.

A report is made of 7 cases (5 women, 2 men; 18- to 50-yr-old) with celiac axis compression syndrome characterized by epigastric bruits that prompted angiographic study by percutaneous transfemoral retrograde aortography, with selective catheterization of the superior mesenteric artery. The dominant symptom was epigastric pain or discomfort that was related more to posture and activity than to food and was relieved by recumbancy. Aortography showed compression of the celiac axis and superior mesenteric arteriograms showed good collateral flow in the celiac axis branches via the pancreaticoduodenal vessels. Laparotomy was performed in 5 cases; the celiac axis was found to be compressed by fibromuscular tissue associated with the median arcuate ligament of the diaphragm and intermingled with strands of the celiac plexus. The celiac artery was freed from constriction by incision along its ventral aspect and no attempt at celiac neurectomy or ganglionectomy was made. Only 2 patients were symptom-free as a result of the surgery. A survey of 200 healthy adults (100 men, 100 women, 17- to 30-yr-old) showed epigastric bruits in 6.5%; only one of these had dyspepsia, though dyspepsia was present in 12.5% overall.

3698 JEJUNAL TRANSPORT OF ELECTROLYTES AND WATER IN INTESTINAL DISEASE. *(E.)* Phillips, S. F. (Mayo Clin. Found., Rochester, Minn) and W. C. Schmid. *Gut* 10(12):990-993, 1969.

Decreased absorption of electrolytes (sodium, potassium, chloride, and bicarbonate) and water by the jejunum (from a 20-cm segment) as related to the pathogenesis of diarrhea was examined in patients with intestinal scleroderma (2), ileocolitis (4), gastric hypersecretion (1), and extensive ileal resection (3). Four of the patients were male and 6 were female, with ages ranging from 19 to 69; the 6 healthy control subjects were 22 to 51 yr of age, all of whom absorbed electrolytes and water. Both patients with scleroderma had abnormal absorption (secretion was demonstrated in one of them). Absorption of each electrolyte and water was decreased in ileocolitis in a segment of jejunum that was apparently free of the disease. The patient with islet-cell tumor and gastric hypersecretion also had markedly abnormal absorption. Despite the severe diarrhea in the 3 patients with extensive ileal resection, jejunal absorption was normal. Excretion of fecal fat was excessive in all patients tested.

3699 GASTROINTESTINAL COMPLICATIONS OF THE EHLERS-DANLOS SYNDROME. *(E.)* Beighton, P. H. (St. Thomas Hosp., London, England), J. L. Murdoch and T. Votteler. *Gut* 10(12):1004-1008, 1969.

Gastrointestinal complications of 125 patients from England, the USA and Canada with Ehlers-Danlos syndrome were examined. The most serious but infrequent complications which occurred were intestinal perforation and hemorrhage (2 patients) and less dangerous abnormalities included external hernia, hiatus hernia, eventration of diaphragm, intestinal diverticula, and rectal prolapse. Surgery was difficult in affected patients due to fragility of tissues and bleeding tendency and in the post-operative period, tearing out of sutures and wound dehiscense occurred. Although structural abnormalities of the gastrointestinal tract are common occurrences in Ehlers-Danlos syndrome, few patients seemingly have any serious complications.

3700 THE PRESENCE OF N_2-FIXING BACTERIA IN THE INTESTINES OF MAN AND ANIMALS. *(E.)* Bergersen, F. J. (C. S. I. R. O., Canberra, Australia) and E. H. Hipsley. *J Gen Microbiol* 60(1): 61-65, 1970.

Cultures of N_2-fixing bacteria have been isolated from the feces of man and the intestinal contents of pigs and guinea-pigs. Acetylene-reduction tests indicate that N_2-fixation occurs in the intestine and the best N_2-fixation culture activity was shown by *Klebsiella (K.) aerogenes*. The *K. aerogenes* culture produced H_2 and CO_2 in the ratio of 1:2 when grown anerobically with glucose as energy source in a shaken liquid culture in which 11.7 µg N/ml culture was fixed in 48 hr. All cultures fixed more N_2 anerobically than aerobically, but some fixation occurred when 20% O_2 was present.

3701 THE EFFECTS OF ANALGESIC DRUGS ON GASTROINTESTINAL MOTILITY IN MAN. *(E.)* Neely, J. (St. Bartholomew's Hosp., London, England). *Brit J Surg* 56(12):925-929, 1969.

The effects of morphine and pethidine on gastrointestinal motility were studied by use of pressure-sensitive radio-telemetering capsules sutured into either stomach, duodenum or colon in 15 patients undergoing abdominal operations. Only 2 of 15 patients showed any return of spontaneous gut activity before analgesic injection and both patients had undergone vagotomy (in one patient the pressure capsule had been sewn into gastric antrum, while in another it was placed into cecum). Gut activity returned early in remaining 13 patients, but it was related to either morphine or pethidine injections. A motility response always occurred in gut section where pressure capsule was situated following injection of either drug. Highest luminal pressures were obtained in colon following morphine (15mg). Caution in the interpretation of records of gastrointestinal activity after surgery is suggested, and motility tracing must be carefully correlated with injections of analgesics.

3702 THE TREATMENT OF *GIARDIA LAMBLIA* INFECTION WITH MEPACRINE, METRONIDAZOLE AND FURAZOLIDONE. *(E.)* Bassily, S. (U.S. Naval Med. Res. Unit #3, Cairo, Egypt), Z. Farid, J. W. Mikhail, D. C. Kent and J. S. Lehman, Jr. *J Trop Med Hyg* 73(1): 15-18, 1970.

Results of treatment of *Giardia* (G.) *Lamblia* with mecaprine (100 mg BID-TID, for 5 days), metronidazole (250 mg UID-BID, for 10 days), and furazolidone (100 mg BID-QID, for 7 days) were evaluated in 80 patients (3-52 years old). All 20 patients treated with mepacrine were cured (100%), 19 of 20 patients receiving metronidazole were cured (95%), and 16 of 20 patients treated with furazolidine were cured (80%). All 20 patients receiving placebo continued to be infected to end of 5 week follow-up study. These drugs did not cure patients with other intestinal protozoal infections. Severe nausea and vomiting occurred in 2 patients treated with mepacrine while yellow skin coloration was observed in a third patient. No side-effects were noted in patients receiving metronidazole or furazolidine. Tolerance and lack of side-effects would seemingly make metronidazole (Flagyl) the drug of choice for *G. lamblia* infection.

3703 HEPATIC AMEBIASIS AND ITS TREATMENT WITH METRONIDAZOLE. (*E.*) Chhetri, M. K. (Inst. Postgrad Med. Educ. Res., Calcutta, Indai), N. C. Chakravorty, C. Neelakantan, B. Bhattacharya and S. K. Sarkar. *J Ass Physicians India* 17(11): 681-688, 1969.

Clinical courses of hepatic amebiasis and treatment was observed in 60 patients (50 cases of liver abscess and 10 with hepatitis). No age group was immune to complications while complications were found only in males. Forty-three of 60 patients (71%) with disease belonged to poor classes and abscess formation was 3 times more common in patients from poorer social status. History or presence of disposing factor was detected in 43 cases (60%) with liver abscess and in 4 cases (40%) with amebic hepatitis); past history of amebiasis was present in only 20% of patients with liver abscess or hepatitis (10 and 2 patients each). Poor nutritional status appeared to be predisposing condition in this group and pain in the right hypochondrium, tender hepatomegaly, intercostal tenderness, and pyrexia were commonest clinical features. Aspiration of pus was direct confirmatory evidence of liver abscess and a high erythrocyte sedimentation rate and leucocytosis were present in most cases. A positive indirect hemagglutination test was indirect evidence of amebiasis and useful adjunct to diagnosis; radiological findings aided in diagnosis confirmation. Complications due to abscess rupture occurred in 10 patients, with rupture into peritoneal cavity being fatal in 4 cases. Metronidazole administration was successful in 33 of 34 liver abscess cases (97%) and all patients in the hepatitis group (100%); effective dose was 1200 mg/for 5 days or 2400 mg for 2 days. No adverse side effects were observed. Metronidazole is recommended as drug of choice in adults and children in all forms of amebiasis.

3704 MEASUREMENT OF GASTROINTESTINAL TRANSMURAL ELECTRIC POTENTIAL DIFFERENCE IN MAN. (*E.*) Geall, M. G. (Mayo Clin., Rochester, Minn.), C. F. Code, D. C. McIlrath and W. H. J. Summerskill. *Gut* 11(1):34-37, 1970.

Measurement in 11 patients undergoing abdominal operations of the electrical potential difference between venous blood and the mucosal surface of the gastrointestinal tract showed a highly significant correlation upon comparison. In 6 of these patients, no measurable difference in potential existed between peripheral blood and the serosa of the colon, small intestine, stomach or parietal peritoneum. In healthy persons, the difference between skin-mucosal and blood-mucosal potential difference approximated the potential difference between skin and blood. Both the skin and the gastrointestinal mucosa were negative with respect to blood. Skin-mucosal potential difference did not become stable until about 5 min and varied greatly among different subjects, whereas blood-mucosal potential difference did not change significantly. Skin-blood potential difference was reduced by skin injury and was lower if recorded from regions of the body other than the fingers. No difference in the potential difference was found when flowing KCl and agar-KCl electrolyte bridges were used.

3705 PROFILE OF GASTRIC POTENTIAL DIFFERENCE IN MAN: EFFECTS OF ASPIRIN, ALCOHOL, BILE AND ENDOGENOUS ACID. (*E.*) Geall, M. G. (Mayo Clin., Rochester, Minnesota), S. F. Phillips and W. H. J. Summerskill. *Gastroenterology* 58(4):437-444, 1970.

Transmural potential difference of the human stomach was measured in 9 healthy male volunteers and 2 patients with the Zollinger-Ellison syndrome using a reference electrode placed in a peripheral vein. Potential difference was higher in the body of the stomach than in the antrum. Stimulation of gastric acid secretion by betazole caused only a slight and temporary decrease in potential difference below the basal value, the decrease occurring shortly after betazole was injected and prior to the onset of peak acid output. The administration of acetosalicylic acid, alcohol, or duodenal contents rich in bile and pancreatic enzymes all caused rapid and profound reductions in gastric potential difference. Maintenance of gastric potential difference may be a sensitive indicator of mucosal integrity in man.

3706 SEROLOGICAL EVIDENCE FOR THE IDENTITY OF THE VASCULAR PERMEABILITY FACTOR AND ILEAL LOOP TOXIN OF *VIBRIO CHOLERAE*. (*E.*) Mosley, W. H. (Pakistan-SEATO Cholera Res. Lab., Dacca), K. M. S. Aziz and A. Ahmed. *J Infect Dis* 121(3):243-250, 1970.

The toxin-antitoxin titration procedures for the measurement of neutralizing antibody to vascular permeability factor (in rabbit skin) and to choleragenic toxin (in rabbit ileal loop) were modified to permit a direct comparison of the antibody titers (antitoxin units/ml) by both assays on sera from patients with cholera (range 4 to over 1000) and from hyperimmunized horses, rabbits, and a goat (range 40 to 8000). Two sera from the patients gave identical titers in both assays, 7 sera showed no more than a 30% difference (with the higher values always in the ileal loop test), 2 showed a two-fold difference, 1 a three-fold, and 1 had no detectable titer in either assay. Five of the 6 sera from the animals gave identical titers in both tests with the goat serum showing a 1-fold difference possibly reflecting test variation. Two different toxin preparations (NIH Lot 001 and TX-C-IV-8 DL) from other laboratories were compared to toxin A4 of this study and neutralization curves for each gave identical end points in their respective skin and loop tests. These 2 tests appear to measure a single antigen-antibody reaction suggesting that ileal loop toxin and vascular permeability factor are identical.

3707 NUTRITIONAL FOLIC ACID DEFICIENCY WITH MEGALOBLASTIC CHANGES IN THE SMALL-BOWEL EPITHELIUM. (*E.*) Rosensweig, N. S. (St. Luke's Hosp. Ctr., New York, N. Y.), A. Bianchi, D. W. Chipman and A. Dreskin. *New Eng J Med* 282(15): 859-861, 1970.

case of severe prolonged nutritional folic acid eficiency with megaloblastic changes in the small owel mucosa is reported in a 52-year-old man. The atient was admitted with a long-standing history f chronic alcoholism, several months of poor ietary intake, diarrhea, and megaloblastic anemia. peroral duodenal biopsy revealed shortened villi, egaloblastic nuclei in the crypt epithelial cells nd the villus epithelial cells and an infiltration f mononuclear cells in the lamina propria. After reatment with folic acid, 5 mg t.i.d., the megalolastic changes in the bone marrow and duodenum reurned to normal and the diarrhea disappeared.

708 UNUSUAL *SPHAEROPHORUS* SPECIES FROM THE LARGE INTESTINE OF MAN. *(E.)* Pearson, . A. (Oak Ridge Ass. U. Tennessee) and E. Balish. *ppl Microbiol* 19(3):458-462, 1970.

he levels of *Sphaerophorus* (designated as isolate -13-68) and other anerobic microorganisms in the eces of two cancer patients (chronic myelogenous eukemia and idiopathic thrombocytopenia) were etermined by culturing on sheep blood-agar before, nd for several weeks after, cobalt irradiation herapy. Isolate 6-13-68 showed extreme polyorphism (rods, filaments, and spheroids) and was major component of the anerobic fecal microlora. The levels of isolate 6-13-68 as well as f *Bacteroides* and *Clostridium perfringens* declined uring the third week after irradiation treatment n one patient and could not be detected for 4 eeks, but after a second irradiation treatment, solate 6-13-68 (at concentrations of 10^6 to 10^9) was again a predominant component of the anerobic icroflora. In the second patient, the levels reained fairly constant (10^6 to 10^{10} viable cells/ m feces). Isolate 6-13-68 most closely resembles *phaerophorus ridiculosis* in its biochemical (produces gas, foul odor, hydrogen sulfide; is β-hemolytic; and hemagglutinates sheep erythrocytes) and morphologic characteristics.

3709 ALTERATIONS IN HUMAN INTESTINAL MICROFLORA DURING EXPERIMENTAL DIARRHEA. *(E.)* Gorbach, S. L. (Roy. Postgrad. Med. Sch., London, England), G. Neale, R. Levitan and G. W. Hepner. *Gut* 11(1):1-6, 1970.

Large quantities of fluid (1500 to 2400 ml of sterile, isotonic electrolyte solution) administered through an intestinal tube caused alterations in small bowel bacteriology in 4 of 7 subjects. In 2 normal individuals, colonic bacteria were found in areas of the small bowel which previously had none after fluid infusion. The fecal microflora were also altered in fluid purge: anerobes were reduced in some subjects and large numbers of *Enterobacter* species emerged in others. In patients with pancreatic insufficiency and diarrhea, the concentration of *Enterobacter* in the feces was directly related to the number of bowel motions per day and treatment with pancreatic enzymes (Cotazym) curtailed the diarrhea and markedly reduced these organisms. Intubation showed that *Enterobacter* occurred in the small intestine and were reduced in the large bowel during periods of normal bowel action. Diarrhea caused by pancreatic enzyme withdrawal or fluid purgation removed the colonic inhibition and allowed these organisms to appear in the feces. Acidic diarrhea induced by lactose feeding to 3 hypolactasic patients caused decreases in the number of *E. coli* in the feces and increases in the number of *Enterobacter* (bacteroides also declined in one subject). Certain alterations in small and large bowel bacteriology observed in these forms of experimental diarrhea have also been described in naturally occurring diarrhea of diverse etiologies.

3710 ACUTE DIARRHEA IN CHILDREN: A STUDY OF 177 POSTMORTEM CASES. *(E.)* Mukherji, S. (Grant Med. Coll., Bombay, India). *J Indian Med Ass* 54(3):109-111, 1970.

3711 BACTERIOLOGY OF DIARRHEA IN NEONATES WITH SPECIAL REFERENCE TO ENTEROPATHOGENIC COLI. *(E.)* Nandi, R. L. (G. R. Med. Coll., Gwalior, India). *J Indian Med Ass* 54(3):103-107, 1970.

3712 CLINICAL EXPERIENCE WITH SELECTIVE AND TOTAL ABDOMINAL VAGOTOMY: SPECIAL REFERENCE TO INSULIN TEST AND POSTVAGOTOMY DIARRHEA. *(E.)* Inberg, M. V. (Dept. Surg., U. Turku, Finland). *Ann Chir Gynaec Fenn* 58(supp. 165):3-68, 1969.

3713 YERSINIA ENTEROCOLITICA: AN IMPORTANT CAUSE OF ENTERITIS. *(Dut.)* Van Noyen, R. (St. Raphael Acad. Hosp., Leuven, Netherlands), J. Vanderpitte and I. Isebaert. *Nederland T. Geneesk* 114(5):188-193, 1970.

3714 DELAYED INTESTINAL OBSTRUCTION FOLLOWING TREATMENT FOR CANCER. *(E.)* Ketcham, A. S. (Natl. Cancer Inst., Natl. Inst. Hlth., Bethesda, Md.), R. C. Hoye, Y. H. Pilch and D. L. Morton. *Cancer* 25(2):406-410, 1970.

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3716 POTASSIUM THERAPY AND GASTROINTESTINAL LESIONS. *(E.)* Emerson, D. N. (Mead Johnson Res. Ctr., Evansville, Indiana). *J Indiana Med Ass* 63(3):228-232, 1970.

3717 COMPARATIVE TRIAL OF FURAZOLIDONE AND CHLORAMPHENICOL IN SYSTEMIC SALMONELLOSIS. *(E.)* Krishna Das, K. V. (Med. Coll. Hosp. Yrivandrum, India). *Indian Pract* 22(11):631-636, 1969.

3718 AN EXTENSIVE COMMUNITY OUTBREAK OF ENTEROPATHIC *ESCHERICIA COLI* $O_{86}:B_7$ GASTROENTERITIS. (*E.*) Pal, S. C. (Natl. Inst. Communic. Dis., Delhi, India), C. K. Rao, T. Kereselidze, A. K. Krishnaswami, D. K. Murty, C. G. Pandit and J. B. Shrivastav. *Bull WHO* 41(6):851-858, 1969.

3719 CROSS-LINKED GELATIN POLYMER ADHESIVE IN REPAIR OF INTESTINAL DEFECTS. (*E.*) Klebanoff, G. (USAF Hosp., Lackland Air Force Base, Texas) and J. Phillips. *J Abdom Surg* 12(3):31-36, 1970.

3720 A CASE OF GASTROINTESTINAL BLEEDING FOLLOWING THE USE OF TOLAZOLINE. (*E.*) Silverman, A. G. (Cedars-Sinai Med. Ctr., Cedars-Sinai Med. Res. Inst., Los Angeles, Cal.), H. I. Wilner and R. Okun. *Toxic Appl Pharmacol* 16(2):318-320, 1970.

3721 TREATMENT OF DIARRHEA SYNDROMES WITH ENTEROCOL (AN 8-HYDROXY-5-QUINOLINE COMPOUND). (*E.*) Gaussen, L. (Foch Med. Surg. Ctr., Paris, France). *Med Proc* 16(1):3-6, 1970.

3722 PROXIMAL SELECTIVE VAGOTOMY. (*E.*) Inberg, K. R. (4th Dept. Surg., U. Helsinki). *Chir Gastroent* 3(4):475-480, 1969.

3723 MESENTERIC MICROCIRCULATION IN RATS WITH EXPERIMENTAL HYPERTENSION. (*E.*) Vacek, L. (Lab. Pathophysiol. Blood Circ., Purkyne U., Brno, Czechoslovakia). *Bibliotheca Anat* 10:359-360, 1969.

3724 UNUSUAL CAUSES OF OCCULT BLEEDING FROM THE GASTROINTESTINAL TRACT. (*E.*) Stafford, E. S. (Johns Hopkins Hosp., Baltimore, Md.), G. D. Zuidema and J. L. Cameron. *Amer J Surg* 119(2):208-212, 1970.

3725 EMERGENCY VASCULAR OPACIFICATION STUDIES IN PATIENTS WITH MASSIVE OCCULT GASTROINTESTINAL BLEEDING. (*E.*) Stahl, W. M. (New York U. Sch. Med., New York), A. E. Dumont, R. M. Abrams, E. R. Beranbaum and H. Epstein. *Amer J Surg* 119(2):118-121, 1970.

3726 CHOLERA. (*E.*) Bart, K. J. (Inst. Publ. Hlth., Dacca, East Pakistan) and W. H. Mosley. *Lancet* 1(7649):721-722, 1970.

3727 POST SURGICAL ADHESIVE INTESTINAL OBSTRUCTION IN CHILDREN. (*Rus.*) Topuzov, V. S. (Pierogov Med. Inst., Odessa, USSR). *Vestn Khir* 102(12):72-78, 1969.

3728 MASSIVE GASTROINTESTINAL HEMORRHAGES IN PATIENTS WITH DIAPHRAGMATIC HERNIAS. (*Ger.*) Stucker, F. J. (Surg. U. Clin. Polyclin. Koln, Germany) and O. Giersberg. *Munchen Med Wschr* 112(9):375-379, 1970.

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3732 MALABSORPTION DUE TO CYTOSTATICS. (*E.*) Berndt, H. (Robert Roessle Clin., Berlin, Germany). *Digestion* 2(6):358-361, 1969.

3733 INTESTINAL STRANGULATION IN RATS MONOCONTAMINATED WITH *SPHAEROPHORUS NECROPHORUS*. (*E.*) Yale, C. E. (U. Wisconsin Med. Sch., Madison) and V. R. Dowell, Jr. *Surgery* 67(3):478-483, 1970.

3734 BENIGN MESENCHYMOMA. (*E.*) Bugg, E. I. (Duke U. Med. Ctr., Watts Hosp., Durham, N. C.) and R. S. Mathews. *Southern Med J* 63(3):268-273, 1970.

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3736 RADIATION EFFECTS ON THE HUMAN INTESTINAL MUCOSA. (*E.*) Wiernik, G. (Churchill Hosp., Oxford, England) and M. Plant. *Curr Topics Radiat Res* 6:325-368, 1970.

3737 CHRONIC OCCLUSION OF THE SUPERIOR AND INFERIOR MESENTERIC VEINS: REPORT OF A CASE. (*E.*) Goldstone, J. (VA Hosp., San Francisco, Cal.), W. S. Moore and A. D. Hall. *Amer Surg* 36(4):235-237, 1970.

3738 PREVENTABLE ACUTE ABDOMINAL EMERGENCIES: FOUR CASES. (*E.*) Kirkegaard-Jensen, U. (Copenhagen County Hosp., Denmark). *Acta Chir Scand* 136(1):45-51, 1970.

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740 EXPERIENCE IN THE APPLICATION OF THE INSTRUMENTAL MECHANICAL SUTURE IN SURGERY OF
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3743 BERBERINE IN THE TREATMENT OF DIARRHEA OF INFANCY AND CHILDHOOD. (*E.*) Sharda, D. C. (Jawahar Lal Nehru Med. Coll., Ajmer, India). *J Indian Med Ass* 54(1):22-24, 1970.

744 AN EXPERIMENTAL TRIAL OF GASTRIC PLICATION AS A MEANS OF WEIGHT REDUCTION IN THE RAT. (*E.*) Kirk, R. M. (Hampstead Gen. Hosp., London, England). *Brit J Surg* 56(12):930-933, 1969.

3745 THE DANGER OF ANTIBIOTIC PREPARATION OF THE BOWEL FOR SURGERY. (*E.*) Thieme, E. T. (St. Joseph Mercy Hosp., Ann Arbor, Mich.) and G. Fink. *Surgery* 67(3):403-408, 1970.

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3747 ESOPHAGO-ILEO-COLONPLASTY FOR CICATRICIAL STENOSIS. (*It.*) Caprini, A. (Hosp. Inst. C. Poma, Mantova, Italy), L. G. Casali, L. Magnani and A. Mossini. *Chir Gastroent* 3(4):443-464, 1969.

3748 HOUSEFLIES, THE AVAILABILITY OF WATER AND DIARRHEAL DISEASES. (*E.*) Wolff, H. L. (Inst. Trop. Med., U. Leiden, Netherlands), W. J. Van Zul and M. Roy. *Bull WHO* 41(6):952-959, 1969.

3749 CLINICAL RESULTS OF TREATMENT OF ACUTE INFECTIOUS ENTERITIS IN YOUNG CHILDREN USING 2-ACETAMIDO-4-(5-NITRO-2-FURYL)-THIAZOLE (*It.*) Fanuele, G. (Inst. Clin. Pediat., U. Naples, Italy) and G. Stoppoloni. *Pediatria [Naples]* 77(4):517-527, 1969.

3750 CLINICAL EXPERIMENTATION IN PEDIATRICS IN ACUTE INFECTIOUS DIARRHEA. (*It.*) Iovino, A. (Santobono Child. Hosp., Naples, Italy) and P. Perrotta. *Gazz Med Ital* 128(10):574-583, 1969.

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3753 AN EPIDEMIC OF NEONATAL DIARRHEA IN ASSOCIATION WITH POSITIVE CULTURES OF *CORNEYBACTERIUM DIPTHERIAE. (E.)* Kho, L. K. (Husada Hosp., Jakarta, Indonesia), H. S. Goh and R. Warsa. *Paediat Indonesia* 9(5):203-209, 1969.

3754 WATER AND ELECTROLYTE LOSSES DUE TO CHOLERA IN INFANTS AND SMALL CHILDREN: A RECOVERY BALANCE STUDY. (*E.*) Mahalanabis, D. (Johns Hopkins U. Ctr. Med. Res. Training, Calcutta, India), C. K. Wallace, R. J. Kallen, A. Mondal and N. F. Pierce. *Pediatrics* 45(3):374-385, 1970.

3755 URINARY EXCRETION OF 5-HYDROXYINDOLYLACETIC ACID IN NORMAL SUBJECTS AND IN SOME DISEASES OF THE DIGESTIVE APPARATUS. (*It.*) Gabasio, S. (Dept. Clin. Med., U. Turin, Italy), C. S. Guidetti and T. Grassi. *Minerva Gastroent* 15(3):136-139, 1969.

3756 CONTROLLED THERAPEUTIC EXPERIMENTATION IN CASES OF PSYCHOGENOUS GASTROENTERIC DISTURBANCE. (*It.*) Malaguti, P. (C. A. Pizzardi Hosp., Bologna, Italy). *Minerva Med* 61(11):479-484, 1970.

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3759 GASTROINTESTINAL CANCER AND NUTRITION. (*E.*) Gregor, O. (U. Hosp. Prague, Czechoslovakia), R. Toman and F. Prusova. *Gut* 10(12):1031-1034, 1969.

3760 CHEMICAL-ANTIBIOTIC THERAPY FOR INTESTINAL INFECTIONS. (*Por.*) (anon) *Resen Clinicocient* 38(11-12):282-285, 1969.

3761 ENDEMIC TYPHOID FEVER IN THE RAILWAY POPULATION OF AJMER: A STUDY OF OVER 300 PATIENTS. (*E.*) Kapoor, S. C. (Western Railway Hosp., Ajmer, India), G. D. Moody, A. K. Sen, D. S. Rawat, C. M. Pandey and P. M. Monga. *J Ass Physicians India* 17(11):671-679, 1969.

3762 A PROMISING APPROACH TO THE PREPARATION OF LIVE VACCINE AGAINST BACCILARY DYSENTERY. (*E.*) Mel, D. M. (Yugoslavia), B. L. Arsic, B. D. Nikolic, M. L. Radovanovic, B. I. Sokolovski, D. J. Djordjevic and T. P. Miladinovic. *Rev Int Serv Sante Armees Terre Mer Air* 42(12):831-837, 1969.

3763 *IN VITRO* AND *IN VIVO* STUDIES OF STREPTOMYCIN-DEPENDENT *CHOLERA VIBRIOS*. (*E.*) Felsenfeld, O. (Delta Primate Res. Ctr., Tulane U. Covington, La.), A. Stegherr-Barrios, E. Aldova, J. Holmes and M. W. Parrott. *Appl Microbiol* 19(3):463-469, 1970.

3764 INCIDENCE OF *SALMONELLAE* IN MEAT IMPORTED FROM THE REPUBLIC OF IRELAND. (*E.*) Thomas, K. L. (Publ. Hlth. Lab., Conway, England) and A. M. Jones. *Med Officer* 123(2):19-20, 1970.

3765 ALLOGENIC HEPATIC EXTRACORPOREAL ASSIST IN ACUTE LIVER FAILURE: AN EXPERIMENTAL STUDY. (*E.*) DeMaria, A. (Inst. Semeiotic Surg. U. Catania, Italy), V. Rocchi, S. Libra and G. Giuffrida. *Int Surg* 53(3):206-209, 1970.

3766 THE UNMASKING OF TYPHOID FEVER. (*E.*) Woodward, T. E. (U. Maryland Sch. Med., Baltimore). *S Afr Med J* 44(5):99-106, 1970.

- P:Absorp (3119)
- P:Secr:Hepatobil (3210)
- P:Gen (3253)
- Diagproc (3265) (3267) (3285) (3286) (3292)
- D:Stomduo (3349) (3351) (3358) (3369) (3371) (3372) (3376)
- D:S.Intest (3421)
- D:L.Intest (3461) (3494) (3497) (3505)
- D:Pancreas (3520)
- D:Livbil (3546) (3547)
- D:Livbil:A.V.Hep (3627)
- D:Livbil:C.Hep (3647)
- D:Livbil:Gallb (3663) (3668) (3683)
- D:Gen:Parasit (3767)

GENERAL

Parasitology

3767 THORACIC DUCT CHANGES IN SCHISTOSOMAL HEPATIC FIBROSIS. (*E.*) Sadek, A. M. (Dept. Surg., U. Alexandria, UAR), A. Aboul-Enein, E. Hassenein and A. Ismail. *Gut* 11(1):74-78, 1970.

Changes in abdomino-thoracic lymphatics were studied in 20 patients with schistosomal hepatic fibrosis (10 with ascites), 6 patients with heart failure, and 10 control subjects. Dilatation of thoracic duct occurred in patients with schistosomal hepatic fibrosis while thoracic dilatation with tortuosity, an increase (2- to 8-fold) in thoracic duct volume, and dilated and tortuous abdominal lymphatic occurred in patients with schistosomal hepatic fibrosis with ascites. Increased lymph flow rate and pressure (2 to 4 times greater than normal) occurred in patients with thoracic fistulas. Increased amounts of lymph seemingly are formed in schistosomal hepatic fibrosis, thereby perpetuating or initiating ascites formation.

3768 RECTAL BLEEDING DUE TO *TRICHURIS TRICHIURA*. (*E.*) Fisher, R. M. (Red Cross War Mem. Child. Hosp., Cape Town, Union South Africa) and B. J. Cremin. *Brit J Radiol* 43(507):214-215, 1970.

Trichuris trichiura (whipworm) infestation causing rectal bleeding was diagnosed in 3 children (age 4 to 5) by double-contrast enemas (originally given to exclude polyps as a cause of the bleeding). The parasite was characterized by two typical appearances: first, by wavy linear translucencies in bas-relief against the air-diluted barium coated bowel and second, by a coil-whip or pin-wheel appearance. The parasites were distributed throughout the whole of the large bowel and the translucencies were due to the free-hanging tail of the parasite. The radiological diagnosis of *Trichuris trichiura* infestation was confirmed at sigmoidoscopy and on stool examination.

3769 CHAGAS DISEASE OF THE COLON AND RECTUM. (*E.*) Todd, I. P. (St. Mark's Hosp., London, England), N. H. Porter, B. C. Morson, B. Smith, C. A. Friedmann and R. A. Neal. *Gut* 10(12):1009-1014, 1969.

An unusual case of Chagas disease (a rare condition in patients anywhere but in Central and Latin America) was found in a white 57-yr-old woman born in Britain, who had spent only a short time in an area where the disease is endemic (thus representing perhaps the first case of Chagas disease to be treated in Britain). The patient suffered increasing dysphagia, constipation and abdominal distension over a 6-year period and exhibited mega-esophagus, megacolon, megasigmoid, and megarectum. Sphincteric responses had been considerably weakened by straining to relieve constipation. Successful treatment included resection of the dilated sigmoid and upper rectum and anastomosis of the descending colon to the extraperitoneal rectum. Treatment with Compound 349C59 (8-[6-N'-(3-hydroxybutyl) piperazinohexylamino]-6-methoxyquinoline dihydrogen maleate), 45 mg p.o., showed some effect on the parasites by an immediate drop in titer; however, the sera remained positive during a follow-up period of 7 months.

3770 EVIDENCE OF TRANSPLACENTAL PASSAGE OF SPECIFIC ANTIBODY IN SCHISTOSOMIASIS MANSONI IN MAN. (*E.*) Hillyer, G. V. (Dept. Microbiol., U. Chicago, Illinois), R. Menendez-Corrada, R. Lluberes and F.Hernandez-Morales. *Amer J Trop Med Hyg* 19(2):289-291, 1970.

Transplacental passage of specific antibodies in *Schistosoma mansoni* infection was demonstrated in mother-infant pairs. Eighteen of 22 mother-infant pairs demonstrated (circumoval precipitin method) a direct correspondence in titer (1+ to 4+); one matched pair revealed a greater reaction in mother than in child (4+ vs 1+). In three instances, the mother was weakly positive (1+), with 3 children exhibiting negative reactions. Five normal controls were negative for both mother and child. Five of 7 matched samples with titers of 2 to 3+ revealed (cercarial slide-flocculation method) similar antibody titer in both mother and child; mother exhibited higher titers than child in 2 instances. Seven of 19 matched samples demonstrated immunoprecipitins to adult worm extracts (Ouchterlony double-diffusion method) while 10 matched samples exhibited immunoprecipitins to cercarial extracts. Using simple radial immunodiffusion, levels of immunoglobulin G of mother and child were similar (16.00 ± 3.49 mg/ml vs 15.00 ± 3.65 mg/ml resp., immunoglobulin A levels in mothers averaged 2.71 ± 0.90 mg/ml (immunoglobulin A was not observed in infant cord blood) and immunoglobulin M levels in mothers averaged 0.94 ± 4.2 mg/ml (3 of 16 infants had no measurable immunoglobulin M level while 3 infants demonstrated levels measuring 0.16, 0.17, and 0.04 mg/ml). Transplacental passage of specific antibodies from mothers to neonatal infants in *Schistosoma mansoni* infection seemingly is due to serum immunoglobulin G.

3771 IDENTIFICATION OF INTESTINAL HELMINTH EGGS IN OLD WORLD PRIMATES. (*E.*) Schilling, P. (Natl. Naval Med. Ctr., Bethesda, Md.), M. T. Jessee and J. A. Stunkard. *Lab Anim Care* 20(1):83-87, 1970.

3772 MEXAFORM AND ENTOBEX THERAPY IN AMEBIC DYSENTERY. (*E.*) Tjaij, J. K. (Med. Sch. U. North Sumatra, Medan, Indonesia), N. Raid, T. Irawati, D. Siregar, K. I. Hiong and T. B. Eng. *Paediat Indonesia* 9(5):210-214, 1969.

3773 PAROMOMYCIN AS EFFECTIVE TREATMENT OF *TAENIA* INFECTIONS. (*E.*) Botero, D. (Sch. Med., U. Antioquia, Medellin, Colombia). *Amer J Trop Med Hyg* 19(2):234-237, 1970.

3774 *TOXOCARA CANIS* INFECTION IN BABOONS: I. ANTIBODY, WHITE-CELL, AND SERUM-PROTEIN RESPONSES FOLLOWING INFECTION. (*E.*) Aljeboori, T. I. (Sch. Hlth., Oklahoma U., Oklahoma City) and M. H. Ivey. *Amer J Trop Med Hyg* 19(2):249-254, 1970.

3775 AN APPLICATION OF THE KERMACK-McKENDRICK THEORY TO THE EPIDEMIOLOGY OF SCHISTOSOMIASIS. (*E.*) Goffman, W. (Dept. Preventive Med., Case Western Reserve U., Cleveland, Ohio) and K. S. Warren. *Amer J Trop Med Hyg* 19(2):278-283, 1970.

3776 SCHISTOSOMIASIS MANSONI IN THE CHIMPANZEE: THE NATURAL HISTORY OF CHRONIC INFECTIONS AFTER SINGLE AND MULTIPLE EXPOSURES. (*E.*) Sadun, E. H. (Walter Reed Army Inst. Res., Washington, D.C.), F. Von Lichtenberg, A. W. Cheever and D. G. Erickson. *Amer J Trop Med Hyg* 19(2):258-277, 1970.

3777 INTESTINAL PARASITES AND NUTRITIONAL STATUS: II. PARASITIC INFECTION IN CHILDREN IN SOUTH CAROLINA. (*E.*) Lease, E. J. (Sch. Pharm., U. South Carolina, Columbia), B. W. Dudley and M. F. Ziegler. *J S Carolina Med Ass* 66(2):42-45, 1970.

3778 PREVALENCE OF INTESTINAL PARASITES IN LUCKNOW. (*E.*) Vidyarthi, S. C. (King George's Med. Coll., Lucknow, India). *Indian J Med Sci* 23(12):654-660, 1969.

3779 POSSIBILITY OF REINFESTATION BY OXYURIS IN A SAMPLE POPULATION OF CHILDREN. (*It.*) DiRocco, P. (Hosp. Celesia Di Gerrivarolo, Italy). *Ig Mod* 62(5-6):333-338, 1969.

3780 PARASITIC INVASIONS OF THE ALIMENTARY TRACT OF VIETNAMESE APPRENTICES AND THEIR ERADICATION. (*E.*) Gerwel, C. (Med. Acad., Poznan, Poland), E. Chwirot, R. Karlewicz and Z. Pawlowski. *Bull Inst Mar Med Gdansk* 20(3-4):217-220, 1969.

3781 FILTRATION OF *SCHISTOSOMA MANSONI* BY EXTRACORPOREAL BLOOD CIRCULATION. (*Por.*) Vieira, O. M. (Fac. Med. Fed., U. Rio De Janiero, Brazil), M. A. Santos, H. Murad, J. Hugill and M. De Andrade. *Hospital* 76(5):1729-1738, 1969.

3782 TEN CASES OF MEDICAL CURE OF CIRCUMSCRIBED AMEBIC ABSCESS OF THE LIVER: STUDIED CLINICALLY AND BY LIVER SCANNING. (*Fr.*) Payet, M. (Clin. Med., Dakar, Senegal), M. Sankale, Y. Bresson, J. P. Ancelle and G. Ballon. *Presse Med* 77(49):1805-1808, 1969.

3783 ANTIPARASITIC ACTION OF A NEW DRUG IN HOOKWORM DISEASE. (*Sp.*) Canal Feijoo, E. J. (Fac. Med., Nat. U. Tucuman, Argentina), E. Iglesias, M. Norymberg and R. Robinson. *Prensa Med Argent* 56(42-43):1858-1863, 1969.

3784 BIOLOGIC-CHEMICAL MODE OF ACTION OF THE TAPEWORM DRUG N-(2'-CHLORO-4'-NITROPHENYL)-5-CHLORO-SALICYLAMIDE: I. INFLUENCE ON ENZYME SYSTEMS. *(Ger.)* Putter, J. (Bayer AG Drug Co., Wuppertal-Elberfield, Germany). *Arzneimittelforschung* 20(2):203-205, 1970.

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3786 RECURRENT MALABSORPTION SYNDROME WITH ACHYLIA, JEJUNAL MICROBIAL AND PARASITIC INFESTATION. *(Fr.)* Tolot, F. (no affil), A. Carel, J. P. Lenglet and M. Abry. *J Med Lyon* (1176):1675-1681, 1969.

3787 FURTHER OBSERVATIONS ON THE LIVER FLUKE (*FASCIOLA HEPATICA L.*) HOMOGENATE CAPILLARY PERMEABILITY ACTIVITY. *(E.)* Baglioni, T. (Fac. Vet. Med., U. Milan, Italy), A. Locatelli and C. Paoletti. *Path Europ* 4(4):384-386, 1969.

3788 A STUDY OF TWO IMMUNOLOGICAL TESTS IN THE DIAGNOSIS AND PROGNOSIS OF HYDATID DISEASE. *(E.)* Bradstreet, C. M. P. (Standards Lab. Serological Reagents, London, England). *J Med Microbiol* 2(4):419-433, 1969.

- D:Livbil:Cirrh (3659)

DESCRIPTION OF INDEXES

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ne SUBJECT INDEX is based on a hierarchial system of classification in which *major index terms* are modified y one or more *key word descriptors*. The *key word descriptors* are listed in decreasing order of importance nd describe the content of the abstract or citation. In addition, in this indexing system, some *key word escriptors* will also be used as *major index terms,* thus providing in-depth indexing of each document. An ostract or citation number, in brackets, will be found after the *key word descriptors*. Abstracts will be dentified by an asterisk outside of the brackets.

n illustrative example of this indexing system follows:

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    Colon, Carcinoma, Radiological Detection, Rectum (0188)*

OLON
    Cancer, Polyps, Radiological Detection (0188)*

ECTUM
    Cancer, Polyps, Precancerous (0188)*

ANCER
    Large Intestine, Detection, Radiology (0188)*

IAGNOSIS
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PREFACE

GASTROENTEROLOGY ABSTRACTS and CITATIONS is a publication of the National Institute of Arthritis and Metabo Diseases. This specialized information medium has been initiated to fill an existing great need in the fie of gastroenterology and to assist the Institute in meeting its obligations to foster and support laboratory and clinical research into the nature, causes, and therapy of diseases of the gastrointestinal tract. Publication of GASTROENTEROLOGY ABSTRACTS and CITATIONS makes available citations of all current papers relevant to this field from medical journals published throughout the world. Approximately one-third of th citations dealing with the major aspects of gastroenterology have accompanying abstracts.

The issuing of GASTROENTEROLOGY ABSTRACTS and CITATIONS under the auspices of the National Institute of Arthritis and Metabolic Diseases will provide a much needed current awareness tool to scientists and will facilitate greater integration of research and clinical efforts in this field. The number and great divers of publications in the area of gastroenterology makes it imperative that an appropriate service be availabl investigators and practitioners so that they may be apprised of progress with a minimum of delay. Our aim to provide the readers with a readily systematized compilation of current published work. The publication will provide the greatest usefulness if these interested investigators will contribute their ideas and comm for consideration whenever possible.

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NOTE

Journal names are abbreviated according to the list of abbreviations used by *Index Medicus*. Fo journals not covered by *Index Medicus*, the abbreviations (with some modifications) found in *World Medical Periodicals*, 3rd Edition, are used.

LANGUAGE ABBREVIATIONS

Afr.	Afrikaans	It.	Italian
Ar.	Arabic	Jap.	Japanese
Bul.	Bulgarian	Kor.	Korean
Ch.	Chinese	Latv.	Latvian
Cz.	Czech	Lith.	Lithuanian
Dan.	Danish	Nor.	Norwegian
Dut.	Dutch	Pol.	Polish
E.	English	Por.	Portuguese
Eston.	Estonian	Rum.	Rumanian
Fin.	Finnish	Rus.	Russian
Fl.	Flemish	Ser.	Serbo-Croatian
Fr.	French	Sl.	Slovak
Ger.	German	Sp.	Spanish
Gr.	Greek	Sw.	Swedish
Heb.	Hebrew	Th.	Thai
Hun.	Hungarian	Turk.	Turkish
Ic.	Icelandic	Uk.	Ukrainian
In.	Indonesian	Viet.	Vietnamese

ABBREVIATIONS USED IN ABSTRACTS

ACTH	adrenocorticotropic hormone	mC,µC	milli-,microcurie(s)
ADP	adenosine diphosphate	mg	milligram(s)
AMP	adenosine monophosphate	min	minute(s)
ATP	adenosine triphosphate	ml	milliliter(s)
BSP	sulfobromophthalein	mm	millimeter(s)
C	degrees centigrade	MTD	maximum tolerated dose
cm	centimeter(s)	ng	nanogram (10^{-9})
CNS	central nervous system	pg	picogram (10^{-12})
cpm	counts per minute	p.o.	orally
DNA	deoxyribonucleic acid	ppm	parts per million
e.g.	for example	r	Roentgen
g	gram(s)	RBC	red blood cells (erythrocytes), red blood count
µg	microgram(s)		
hr	hour(s)	resp.	respectively
i.m.	intramuscular	Rev.	review (only in citations)
i.p.	intraperitoneal	RNA	ribonucleic acid
IU	international unit(s)	s.c.	subcutaneous
i.v.	intravenous	sec	second(s)
kg	kilogram(s)	SGOT	serum glutamic-oxalacetic transaminas
LD_{50}	median lethal dose(s)	SGPT	serum glutamic-pyruvic transaminase
LDH	lactic acid dehydrogenase	U	unit(s)
m	meter(s)	UV	ultraviolet
M	molar	WBC	white blood cells (leukocytes), white blood count
mEq	milliequivalent(s)		
mM	millimolar	yr	year(s)
µM	micromolar		

PRE-CLINICAL SCIENCES

MORPHOLOGY, CELLULAR STRUCTURE AND HISTOCHEMISTRY

789 TIME COURSE AND DOSE-RESPONSE CHARACTERISTICS OF AFLATOXIN B_1 EFFECTS ON RAT IVER RNA POLYMERASE AND ULTRASTRUCTURE. *(E.)* ong, R. S. (Dept. Nutrit. Food Sci., Massachusetts nst. Tech., Cambridge) and G. N. Wogan. *Cancer es* 30(2):294-304, 1970.

reatment of 100 g male Fischer rats with aflatoxin (1 mg/kg i.p.) produced a rapid and marked inibition of the activity of the liver DNA-dependent NA polymerase. Over a period of 36 hr after osing, ultrastructural alterations of the liver ell nucleolus generally correlated with the inibition of enzyme activity. Mg^{++}-activated and $^{++}$-$(NH_4)_2SO_4$-activated RNA polymerase activities, ere maximally inhibited (15 min after dosing) by out 60% which continued for about 12 hr; by 36 , enzyme activities returned to pretreatment evels. Hepatocyte nucleoli 15 min after treatent showed decreased prominence of nucleolonema, d nucleolar microsegregation was observed; acrosegregation of granular and fibrillar nucleoar components (nucleolar capping) was observed ithin 1 hr after treatment, and the segregation ersisted up to 12 hr. By 36 hr, reintegration of ucleolar components was observed. Inhibition of NA polymerase activity was directly related to flatoxin B_1 dose, with a correlation coefficient f -0.89 for the Mg^{++}-activated system and -0.97 or the Mn^{++}-$(NH_4)_2SO_4$-activated system. Nucleolar isorganization was observable at 0.2 mg/kg aflaoxin B_1 but was not demonstrable at 0.1 mg/kg, a ose which was capable of a 5% inhibition of both ypes of enzyme activity. A decrease in nuclear NA/DNA ratio was observed under conditions where NA polymerase activity was decreased.

790 A FINE STRUCTURAL ANALYSIS OF THE INTERCELLULAR JUNCTIONS IN THE MOUSE LIVER. *(E.)* oodenough, D. A. (Harvard Med. Sch., Boston, Mass.) nd J. P. Revel. *J Cell Biol* 45(2):272-290, 1970.

ranyl acetate staining (en bloc), staining with olloidal lanthanum, negative staining with phoshotungstate, and freeze cleaving techniques were sed to examine the zonulae occludentes and gap unctions in the intact livers of Charles River mice nd in a junction-rich membrane fraction from homoenized mouse liver. The zonula occludens is aranged as a meshwork of branching and anastomosing hreadlike contacts sealing the lumen of the bile analiculi from the liver intercellular space while he gap junction is characterized in section by a 0 Å gap between apposed junctional membrane outer eaflets; permeation of the gap junction with lanhanum or phosphotungstate reveals a polygonal lattice of subunits with a center-to-center spacing f 90-100 Å (freeze-cleaved gap junctions show a imilar lattice). Extraction of junction-rich fracions with 60% aqueous acetone results in a disappearance of the 20 Å gap in sectioned pellets and an nability to demonstrate the polygonal lattice with ither the freeze-cleaved or negative staining techiques; extraction of the membranes with 50% acetone oes not produce this effect. Thin-layer chromaography of the acetone extracts reveals a group of hospholipids in the 60% extract that are not detectable in the 50% extract. Acetone does not cause any detectable change in the structure of the zonula occludens, but the occluding junction becomes leaky to lanthanum following acetone treatment.

3791 ENZYMATIC REDUCTION OF THE AZO DYE, ACID YELLOW, BY EXTRACTS OF *STREPTOCOCCUS FAECALIS* ISOLATED FROM RAT INTESTINE. *(E.)* Scheline, R. R. (Sch. Med. U. Bergen, Norway), R. T. Nygaard and B. Longberg. *Food Cosmet Toxic* 8(1):55-58, 1970.

Very little reduction of the azo dye, acid yellow (disodium salt of 5-(4-sulphophenylazo)-2 aminobenzene sulfonic acid), was detected when it was anerobically incubated, under various conditions, with the supernatant fraction alone from sonically disrupted cells of *Streptococcus (S.) faecalis* isolated from the cecal contents of a male albino rat. Reduction was extensive in the presence of NADPH- or, particularly, NADH-generating systems. The azoreductase activity of the supernatant fraction was greatest when incubation was carried out between 36 to 44° C at about pH 6.3 to 6.4. Riboflavin, flavine mononucleotide and flavine adenine dinucleotide each markedly stimulated the reducing activity of the supernatant fraction, while the reduction was considerably depressed by the flavin inhibitor quinacrine. Flavoproteins seemingly are involved in the reduction of acid yellow by the supernatant fraction of extracts *S. faecalis* and more than one system may be involved.

3792 ENZYME HISTOCHEMISTRY AND HORMONES OF THE DEVELOPING GASTROINTESTINAL TRACT OF THE CHICK EMBRYO: IV. THE ENZYME ACTIVITY DURING FUNCTIONAL DIFFERENTIATION. *(E.)* Baxter-Grillo, D. L. (Dept. Anat., U. Ibadan, Nigeria). *Histochemie* 21(3):268-276, 1970.

The activities of leucine aminopeptidase, acid phosphatase and β galactosidase (which may be associated with the process of cell death which occurs during the differentiation of the gastrointestinal tract) were assayed chemically and histochemically in the intestine and stomach-complex of embryos and newly-hatched chicks. Fluctuations in the concentration of the leucine aminopeptidase activity in the developing chick gastrointestinal tract occurred from the 8th day until hatching; there was a gradual rise in activity from the 8th to the 18th day in the stomach and from the 8th to the 14th day in the intestine. The highest activity of leucine aminopeptidase occurred in the newly hatched chick. Glucagon produced a small but significant reduction of leucine aminopeptidase activity in the intestine and stomach-complex of both embryonic and newly hatched chicks. Acid phosphatase activity in the stomach increased from the 8th to the 16th day and this was followed by a decrease in activity at 20 days; in the intestine the activity rose from the 8th to the 14th day. The highest activity of acid phosphatase was obtained in the newly hatched chick. Glucagon produced a significant reduction of acid phosphatase activity in the intestine. β galactosidase was demonstrated from the 6th day of incubation in the epithelial cells lining the stomach and the intestine.

3793 AMINE MECHANISMS IN ENTEROCHROMAFFIN AND ENTEROCHROMAFFIN-LIKE CELLS OF GASTRIC MUCOSA IN VARIOUS MAMMALS.

(E.) Hakanson, R. (Dept. Pharmacol., Anat., Histol., U. Lund, Sweden), C. Owman, N. O. Sjoberg and B. Sporrong. *Histochemie* 21(3):189-220, 1970.

Histochemical and chemical analyses for histamine, arylethylamines and the corresponding amino acid decarboxylases were performed on the stomach wall from albino mice, hamsters, guinea-pigs, rabbits, cats, pigs and Rhesus monkeys. Apart from adrenergic nerve terminals, the major cellular stores for gastric amines were mast cells, enterochromaffin cells, and a system of morphologically similar cells designated as enterochromaffin-like cells. Using the histochemical o-phthaldialdehyde technique, histamine could be visualized in gastric mast cells from all species. All argyrophilic epithelial cells in the stomach mucosa emitting a formaldehyde-induced fluorescence were classified as enterochromaffin. Yellow fluorescent, presumably 5-hydroxytryptamine-containing, enterochromaffin cells were recognized in all species and the enterochromaffin-like cells were argyrophilic, not argentaffin. A distinguishing feature of enterochromaffin-like cells was their ability to produce and store arylethylamines, such as dopamine, upon administration of an amine presursor, although normally the cells were devoid of fluorogenic amines demonstrable with the formaldehyde method. The regional distribution of the enterochromaffin and enterochromaffin-like cells varied markedly, but the localization of these two systems was characteristic for each species. From observations on the regional and topographic distribution of DOPA decarboxylase it was suggested that the enzyme occurs in both cell systems.

3794 *ANCYLOSTOMA CANINUM*: INTESTINAL PIGMENT GRANULES.

(E.) Lee, C. C. (Dept. Biol., King's Coll., Wilkes-Barre, Pa.). *Exp Parasit* 27(2):246-255, 1970.

The nature and possible function of the intestinal pigment granules of *Ancylostoma caninum* were studied using electron microscopy and histochemical and autoradiographic techniques. Under normal conditions, pigment granules consisted of an inner core and an outer shell, the core being extractable by sodium hydroxide while the shell is resistant. Starvation of the worm resulted in diffusion of the core through the porous shell, lamellar formation of the core, and finally degeneration of the core into small particles of 100 to 200 Å in diameter. Other changes following starvation included the disappearance of glycogen granules from the cytoplasm, swollen mitochondria and endoplasmic reticulum, appearance of large lipid-like globules, and the appearance of glycogen-like particles in some of the mitochondria. Histochemical and autoradiographic studies indicated the presence of a specific protein with incorporated iron derived from host hemoglobin. These granules apparently are composed of inorganic and organic compounds, of which protein and iron are two components and the granules seemingly are a nutrient storage system.

3795 IMMUNOFLUORESCENT HISTOLOGICAL DEMONSTRATION OF THE ANTIGENIC MUCOSAL ESTERASE VI IN THE SUPERFICIAL EPITHELIAL CELLS OF THE HUMAN FUNDIC GASTRIC MUCOSA.

(E.) Kuhlmann, W. D. (Med. U. Clin. Heidelberg, Germany), H. Fritsch and W. Rapp. *Z Ges Exp Med* 152(2):93-103, 1970.

Monospecific, hetero-immune sera, directed against the organ-specific esterase-antigen, VI A, were used to treat cryostat sections of normal human mucosa removed from the body of the stomach. Using fluorescent antiglobulin immune sera it could be demonstrat (according to the gastric histology), that the antig VI A was localized in the mucus secreting surface epithelial cells. The specificity of the immunofluorescent-histochemical assay for organ-specific esterase-antigen was proved by absorption studies.

3796 ACID HYDROLASES IN THE SUCKLING RAT SMALL INTESTINE: I. FRACTIONATION OF MUCOSAL HOMOGENATES.

(E.) Connock, M. J. (Dept. Biochem, U. Birmingham, England) and W. F. R. Pover. *Histochem J* 2(1):35-43, 1970.

Mucosal homogenates of the small intestine of suckling rats were fractionated (fractions I-V) by differential and density gradient centrifugation and analyzed by electron microscopy for acid hydrolases (aryl sulfatase B, acid phosphatase, β-glucuronidase) and for biochemical markers of subcellular organelles. The distribution of markers (DNA for the nuclei, esterase and RNA for microsomes succinate dehydrogenase for mitochondria and alkalin phosphatase for microvilli fragments) indicate the composition of the fractions as follows: I(nuclei, microvillus sheets and cell debris), II (mitochondria), III (mitochondria, and some microsomal and microvillus material), IV (microsomes with some microvilli fragments), and V (cell sap). The distribution of acid hydrolases was indicative of attachment to particulate material with sedimentation properties close to those of mitochondria; however, these enzymes were also present in fractio III-V to greater extent than was mitochondrial succinate dehydrogenase. Subfractionation of fraction II by sucrose density gradient was effective in separating acid hydrolase activity from the activities of all the other markers. Electron micrographs of fraction II material rich in acid hydrola revealed the presence of numerous small electron dense bodies (0.1-0.3 μm in diameter) bounded by a unit membrane.

3797 IRON METABOLISM AND CELL MEMBRANES: II. THE RELATIONSHIP OF FERRITIN TO THE CYTOCAVITY NETWORK IN RAT HEPATIC PARENCHYMAL CELLS.

(E.) Trump, B. F. (Duke U. Med. Ctr., Durham, N. C.), A. U. Arstila, W. D. Bradford and T. D. Kinney. *Amer J Path* 58(3):419-437, 1970.

Two groups of male Holtzman rats, fed a high-fat, protein-deficient diet supplemented with iron for 3, 7, 14, and 21 days or injected with iron in the form of ferric ammonium citrate (400 μg/100 g body weight i.p.), resp., were used to study the intracellular localization of ferritin in the liver.

ı a number of experiments ethionine was given
imultaneously with parenteral iron while in others
ıtophagocytosis was induced after dietary iron
ɔading by a single injection of glucagon. After
ɔth dietary and parenteral iron loading, ferritin
ərticles were seen in different cellular compart-
ents, large numbers of ferritin particles were
een in the cell sap, and ferritin was also found
ı the cytocavitary network (a series of membrane-
nclosed cytoplasmic cavities other than the inner
ompartment of mitochondria). Ferritin was found
ithin the endoplasmic reticulum and microbodies,
ithin the Golgi apparatus and its associated
mall vesicles, and within multivesicular bodies.
he greatest concentration was found within primary
nd secondary lysosomes; in none of the experiments
as ferritin seen within the nuclei or mitochondria.
thionine appeared to trap ferritin within the
iposomes of the endoplasmic reticulum. Auto-
hagocytosis was not prominent in the livers after
ron loading but when autophagocytosis was induced
y glucagon, the newly formed autophagic vacuoles
ppeared to acquire ferritin by fusion with
erritin-filled lysosomes.

798 HISTOLOGICAL REEVALUATION OF EVERTED GUT TECHNIQUE FOR STUDYING INTESTINAL ABSORP-
ION. *(E.)* Levine, R. R. (Boston U. Med. Ctr.,
ass.), W. F. McNary, P. J. Kornguth and R. LeBlanc.
urop J Pharmacol 9(2):211-219, 1970.

histological investigation was made to determine
hether there were any significant changes in the
orphology of everted intestinal sacs used for
bsorption studies. After eversion, the intestinal
acs of Sprague-Dawley rats and golden hamsters
ere morphologically intact but they progressively
ost structural integrity. Changes (edema in villi,
oss of cytoplasmic detail, increasing basophilia)
ere apparent 5 min after incubation at 37C in
xygenated buffer. At 30 min 50-75% of the normal
pithelium had disappeared with intact structures
resent only in the deepest portions of the crypts
nd at 1 hr there was total disruption of the
pithelial border. Tissue damage was slowed at 23C
r in tissues of animals sacrificed under anesthesia.
acs of golden hamsters maintained their integrity
onger than those of the rats. The rat everted sac
reparation when used under experimental conditions
hich delay the appearance of tissue damage seemingly
ay yield useful information concerning transport
cross the epithelial barrier.

799 LYSOSOMAL LOCALIZATION OF HYDROLYTIC EN-ZYMES OF GUINEA PIG LIVER. (*E.*) Patel, V.
Dept. Food Sci. Technol., U. California, Davis) and
. L. Tappel. *Biochim Biophys Acta* 208(1):163-165,
970.

he distribution of acid hydrolases was studied in
uinea-pig livers. The specific activity of the acid
ydrolases in Triton WR 1339-filled lysosomes was
5 to 30 times greater than that in liver homoge-
ates. The same enzymes were purified 4- to 14-fold
hen prepared by the differential centrifugation
ethod developed for isolation of lysosomes from untreated rats. When the livers were fractionated into nuclear, mitochondrial, light-mitochondrial, microsomal and supernatant fractions, most hydrolases, including the lysosome marker, acid phosphatase, were shown to be localized in the light-mitochondrial fraction. Among the hydrolases, α-glucosidase and acid lipase showed considerable activity in the microsomal fraction. Sialidase and β-glucosidase had significant activity in the supernatant fraction, especially at pH 6.0. The pH optima determined in one series of experiments for acid phosphatase, β-glucuronidase, β-N-acetylglucosaminidase, cathepsin D, and lipase were 5.0, 4.0, 4.2, 4.0 and 5.4, resp.

3800 ENHANCED DNA-DEPENDENT RNA POLYMERASE AND RNA SYNTHESIS IN RAT LIVER NUCLEI AFTER ADMINISTRATION OF L-TRYPTOPHAN. *(E.)* Vesely, J. (Inst. Organic Chem., Biochem., Czechoslovak Acad. Sci., Prague) and A. Cihak. *Biochim Biophys Acta* 204(2):614-616, 1970.

Nuclei were isolated from Wistar rats given L-tryptophan (0.2 g/kg i.p.) 3 hr before sacrifice. L-tryptophan *in vivo* increased the activity of the Mg^{2+}-activated RNA polymerase in the isolated rat liver nuclei and a similar (though lesser response) was observed in the presence of Mn^{2+}-$(NH_4)_2SO_4$-activated enzyme. The enhanced activity was observed in intact as well as in adrenalectomized animals. RNA synthesis in the rat liver nuclei was increased in accordance with the increased activity of RNA polymerase. Autoradiography with ^3H-cytidine revealed that in L-tryptophan-treated mice the label was incorporated at a higher rate (40 to 50%) into nucleolar RNA of liver parenchymal cells, this being followed by a shift of the radioactivity into the cytoplasm. When actinomycin D was given concomitantly with L-tryptophan, the response of the Mg^{2+} activated RNA polymerase was completely abolished; only partial depression was observed in the case of the Mn^{2+}-$(NH_4)_2SO_4$-activated enzyme. Both of these enzymes were decreased following administration of actinomycin D.

3801 DEMONSTRATION OF THE CARCINOEMBROYONIC ANTIGEN SPECIFIC FOR DIGESTIVE CANCER IN HUMAN TUMORS MAINTAINED IN ORGANOTYPIC CULTURE. *(Fr.)* Burtin, P. (Inst. Sci. Res. Cancer, Villejuif, France), D. Buffe, S. Von Kliest, E. Wolff and E. Wolff. *Int J Cancer* 5(1):88-95, 1970.

Two human tumors, one derived from a hepatic metastasis of a gastric carcinoma and cultured for 8 yr and the other derived from a colonic cancer and cultured for 7 yr, were studied by immunoflourescence. Antisera prepared against homogenates of these cultured tumors contained antibodies reacting with carcinoembryonic antigen previously found in surgically-removed gastrointestinal tumors.

3802 THE NEUROLOGICAL JUNCTION BETWEEN THE APPENDIX AND ASCENDING COLON. *(E.)* Emery, J. L. (Congenital Anomalies Res. Ctr., U. Sheffield, England) and J. Underwood. *Gut* 11(2):118-120, 1970.

The apparent cecal-appendicular neuronal junction was histologically examined in surgical and necropsy specimens of the appendix and cecum from 74 children, varying in age from 38 weeks in gestation to 12 years. Strip sections from the colon, cecum and appendix were opened down the side opposite the ileocecal valve and frozen sections were cut longitudinally at 12-20μ and stained with Solochrome Cyanin. In none of the specimens studied did the change in ganglion distribution coincide with the anatomical junction between the appendix and the cecum. The junction between the gut wall having an intramural plexus distribution characteristic of the large bowel, and that of the appendix lay at an irregular line around the cecum just below the ileocecal junction. There was no appendix-like innervation extending into the ileum, but in several cases it appeared to approach the appendicular border of the ileocecal valve.

3803 INTRACELLULAR DISTRIBUTION OF PALMITOYL-CoA SYNTHETASE IN RAT LIVER.

(E.) Lippel, K. (U. Miami Sch. Med., Florida), J. Robinson and E. G. Trams. *Biochim Biophys Acta* 206(1):173-177, 1970.

Homogenized livers from 5 fed male Sprague-Dawley rats were used to determine the intracellular location of palmitoyl-CoA synthetase. The cell debris was separated from the nuclei and fractionated on a sucrose gradient and each of the fractions was characterized by enzyme markers, DNA and protein content, and palmitoyl-CoA synthetase activity. Most of the palmitoyl-CoA synthetase activity was found in the microsomes, some activity in the mitochondria, and only traces in the nuclear-plus-cell debris fraction, which contained the plasma membrane plus contaminants from other fractions. The specific activity of palmitoyl-CoA synthetase was highest in those gradient fractions which had a high specific activity of the microsomal or mitochondrial marker enzymes. The specific activity of the palmitoyl-CoA synthetase in plasma membranes was only 25% of the corresponding microsomal specific activity. These results failed to confirm a previous report that the plasma membrane fraction is richest in palmitoyl-CoA synthetase.

3804 NUCLEOPLASMIC RIBONUCLEOPROTEIN PARTICLES OF RAT LIVER: I. SELECTIVE DEGRADATION BY NUCLEAR NUCLEASES.

(E.) Faiferman, I. (New York Blood Ctr., New York), M. G. Hamilton and A. O. Pogo. *Biochim Biophys Acta* 204(2):550-563, 1970.

The components of a nucleoplasmic fraction obtained from rat liver in non-growing conditions were determined by disrupting isolated nuclei with a French press and selective degradation by nuclear nucleases and by fractionation of the nucleoplasm in a sucrose gradient. The nucleoplasm was shown to contain a complex mixture of ribonucleoprotein particles (without the mature ribosomes) and polysomes or polysomal-like structures. Approximately 35% of the rapidly labeled RNA were found in these particles, while the rest remained bound to the chromatin and in addition, these particles contained approximately 80% protein, and less than 1% DNA. The buoyant densities rang between 1.38 and 1.41 g/cm^3 in CsCl. In a sucros gradient fractionation three broad peaks were obtained with average S values of 60, 80 and 110 re The 2 more rapidly sedimenting peaks were selecti digested by nuclear nucleases and pancreatic ribo nuclease and RNA-DNA hybridization experiments wi competition suggested that the 60-S peak was tran ferred to the cytoplasm.

3805 HORMONAL REGULATION OF PHOSPHOENOLPYRUV CARBOXYKINASE ACTIVITY IN LIVER AND KID OF ADULT ANIMALS AND FORMATION OF THIS ENZYME IN DEVELOPING RABBIT LIVER.

(E.) Usatenko, M. S. (Inst. Exper. Med., Leningrad, USSR). *Biochem Me* 3(4):298-310, 1970.

The effects of fasting and hydrocortisone on the activities of both soluble-fraction and mitochondrial phosphoenolpyruvate carboxykinases were studied in rabbit and rat liver and kidney corte (in the rabbit liver these activities were determined at different stages of pre- and postnatal development). The intracellular distribution of phosphoenolpyruvate carboxykinases varied among the livers of rabbit and rat; in the rabbit live most of the activity was located in the mitochondria while in the rat liver most of the activity was in the soluble fraction. Fasting and hydrocortisone administration had no effect on phosphoenolpyruvate carboxykinase activity in liver mitochondria but activity of this enzyme i the soluble fraction of the livers was nearly doubled. Hydrocortisone administration also cau marked increases in rabbit kidney cortex soluble-fraction phosphoenolpyruvate carboxykinase activ but produced no significant changes in mitochond activity. At early stages of embryonic developm rabbit liver did not exhibit phosphoenolpyruvate carboxykinase activity until the 25th day of embryogenesis at which time the activity was extremely low in both the mitochondrial and solubl fractions. Within the first postnatal day phosphoenolpyruvate carboxykinase activity in mi chondrial fractions rose abruptly to values high than those of adult animals and remained elevate throughout the whole postnatal period (up to the 30th day of life). In the soluble rabbit liver fraction, maximal phosphoenolpyruvate carboxykin activity was reached 12 hr after birth at which time it was 87% higher than in adult animals.

3806 ULTRASTRUCTURAL HEPATOCELLULAR ALTERAT INDUCED BY *IN VIVO* FRUCTOSE INFUSION.

Phillips, M. J. (Dept. Path., U. Toronto, Ontari Canada), G. Hetenyi and F. Adachi. *Lab Invest* 22(4):370-379, 1970.

The effects of a large fructose load on the live were examined by infusions via a mesenteric vein catheter with a 20% solution of fructose at a ra of 0.055 ml/min in 14 male Wistar rats. Similar prepared controls consisted of 5 rats infused wi a 20% glucose solution and 7 rats with a saline solution. In fructose-infused animals, subcellu hepatic alterations consisted of hypertrophy of ooth endoplasmic reticulum, hyaloplasmic rare- tion, and the formation of cytolysosomes and ncentric membranous arrays. Rats infused with glucose or saline under identical experimental nditions showed no lesions. In both glucose- d fructose-infused rats, glycogenesis occurred. ere was no measurable change in the water con- nt of the infused livers. The formation of olysosomes, loss of apparently free ribosomes, d hyaloplasmic rarefaction seen in the fructose- used rats was believed a manifestation of uctose toxicity and the hypertrophy of the smooth loplasmic reticulum may be regenerative. The ectron microscope changes in the fructose-infused s were qualitatively similar to those induced oral fructose in a patient with hereditary uctose intolerance. The pathophysiology of the ocellular changes is unknown, but is thought to related to the accumulation within the cell of uctose or its metabolites.

07 IMMUNOFLUORESCENT LOCALIZATION OF ORNITHINE AMINOTRANSFERASE IN RAT LIVER. *(E.)*

ennan, P. C. (Argonne Nat. Lab., Ill.), C. Peraino, J. M. Fry and R. W. Swick. *Argonne Nat Lab Biol d Res Div Ann Rept* 133-135, 1969.

illiant fluorescence was observed in sections of lleted rat liver mitochondria from male 5-week- d SD/Anl(Anl 66) rats fed 60% protein diet ad libi- m, treated with antiserum and then with fluorescein beled antirabbit goat globulin. No specific fluor- cence was seen in similar sections treated with ntrol rabbit serum. Sections from rats fed the 0% otein diet and treated either with antiserum or th control serum did not fluoresce. The ornithine -ornithine:2-oxoacid) aminotransferase specific uorescence in livers from rats fed the 60% protein et was diffusely distributed throughout the cyto- asm, but not in the nuclei of hepatic cells. uorescence was absent in sections from the same ver treated with control serum. When specifically ained sections from rats fed the 60% protein diet re examined with low power, patches of fluorescent lls appeared to fill the entire lobule. In con- ast, fluorescent cells in sections of livers of ts fed the standard diet containing 24% protein re less numerous and more randomly distributed roughout the lobule. The livers of rats fed the protein diet and treated with antiserum showed no ecific fluorescence. These fluorescent antibody sults correlate well with measurements of ornithine inotransferase activity in extracts of livers from ts fed similar diets. The technique should prove eful in further studies of the localization of nithine aminotransferase in normal and diseased vers.

08 EFFECT OF THIOACETAMIDE ON THE EMBRYONIC RAT LIVER AND HEPATOMA CELLS. *(E.)*

rbrodt, A. (Inst. Oncol., Gliwice, Poland) and S. zyzowska-Gruca. *Folia Histochem Cytochem* 8(1): -22, 1970.

e effect of thioacetamide on transplantable Morris patoma and rat liver embryonic cells was investigated by means of histological, cytochemical, and ultrastructural methods, including measurement of the diameter of the nucleoli, and the ultrastructural composition of some nucleoli. Thioacetamide induced enlargement of the nucleoli, increased lipid content in the cytoplasm, and decreased activity of ATPase in the bile canaliculi. Disturbances in the enzymatic activity of thiaminepyrophosphatase in the Golgi apparatus and of acid phosphatase in the lysosomes were more significant in hepatoma than in embryonic liver cells. The reactivity of hepatoma and embryonic liver cells may be a reflection of a different functional state arising from the different degree of development and maturity of these cells.

3809 SPIRONOLACTONE-INDUCED PROLIFERATION OF SMOOTH-SURFACED ENDOPLASMIC RETICULUM IN THE LIVER OF RATS. *(E.)*

Kovacs, K. (Inst. Med., Exp. Surg. U. Montreal, Canada), J. A. Blascheck and C. Gardell. *Z Ges Exp Med* 152(2):104-110, 1970.

The livers of spironolactone-treated rats were studied using light and electron microscope techniques in order to establish the ultra-structural alterations of hepatocytes which develop during intrahepatic enzyme induction. Twenty-seven female Sprague-Dawley rats were divided into three groups: one group was untreated and served as controls; the second group was given 1 ml of distilled water by a stomach tube twice daily for 5 consecutive days; and the third group received spironolactone at a dose of 10 mg in 1 ml of water via stomach tube. In the sixth day the rats were sacrificed and liver tissue was fixed and stained with hematoxyline-phloxine and PAS technique, and frozen sections were also obtained. Light microscopy revealed no marked differences between the livers of control and spironolactone-treated rats while electron microscopy revealed no ultrastructural differences between the livers of untreated controls and of the water-treated rats. In the livers of the rats given spironolactone, there was a marked proliferation of the smooth-surface endoplasmic reticulum and in some cells, a large number of dilated circular and oval vesicles were concentrated in the perinuclear region, or in other parts of the cytoplasm. The granular lamellae of the rough-surfaced endoplasmic reticulum decreased in number and were displaced to the periphery of the cell. Spironolactone seemingly stimulates or induces intrahepatic drug metabolizing enzymes which can counteract several toxic substances.

3810 ADENOSINE TRIPHOSPHATE:ADENOSINE MONOPHOSPHATE PHOSPHOTRANSFERASE ISOZYMES IN RAT LIVER AND HEPATOMAS. *(E.)*

Criss, W. E. (Temple U. Sch. Med., Philadelphia, Pa.), G. Litwack, H. P. Morris and S. Weinhouse. *Cancer Res* 30(2):370-375, 1970.

Adenylate kinase (ATP:AMP phosphotransferase) activity was measured in rat liver and in a series of Morris hepatomas. The adenylate kinase activity was 128 U/g tissue in a group of highly differentiated hepatomas, and 16 U/g in a group of poorly differentiated hepatomas. Rat liver adenylate kinase activity was 148 U/g and increased to 287

U/g upon fasting and decreased to 92 U/g upon refeeding of a glucose diet. Adenylate kinase activity in highly, well- and poorly-differentiated hepatomas did not respond significantly to dietary alterations in the host animals. Four electrophoretically distinct forms of adenylate kinase were found in supernatants from rat liver hepatomas. The 4 isozymes had isoelectric points at pH 5.9 (I), 7.0 (II), 7.6 (III), and 8.2 (IV) and were found in all tumors examined. The activities of Isozymes I, III, and IV were reasonably constant in liver and hepatomas, but the activity of Isozyme III decreased from 121 U/g in normal liver to 14 U/g in the poorly differentiated Novikoff hepatoma. Isozyme III was the major adenylate kinase isozyme in rat liver and it increased to 220 U/g in the liver of fasted rats and decreased to 80 U/g in the liver of refed rats. Isozyme III was the predominant form of adenylate kinase which (in liver) was susceptible to dietary regulation, and the form which (in the tumors) decreased with decreasing differentiation.

3811 THE ORIGIN AND DISTRIBUTION OF ADRENERGIC NERVE FIBERS IN THE GUINEA-PIG COLON. *(E.)* Furness, J. B. (Dept. Zool., U. Melbourne, Victoria, Australia). *Histochemie* 21(4):295-306, 1970.

The origin and distribution of sympathetic fibers in the distal colon of the guinea pig were studied by fluorescence microscopy. The extrinsic adrenergic fibers of the colonic sympathetic nerves followed the inferior mesenteric artery and its branches, and some were associated with the parasympathetic fibers of the pelvic nerves near the colon. Following the removal of the inferior mesenteric ganglion or the destruction of the nerves running with the inferior mesenteric artery, complete adrenergic denervation occurred. A substantial number of varicose, terminal fibers, not associated with blood vessels were observed in the circular muscle and some varicose fibers which were observed in the myenteric plexus were seen in the bundles of nerves running between the nodes of the plexus and also as single fibers which branched from the plexus to end in areas free of ganglion cells. Although some groups of ganglion cells in the submucosa were without adrenergic innervation, three plexuses of adrenergic nerve fibers were detected in the submucosa: a dense plexus of terminal fibers innervating veins and arteries; a plexus consisting of innervated nodes of ganglion cells, connected by bundles of fluorescent and non-fluorescent nerves; and a plexus of varicose and non-varicose fibers, which was not associated with ganglion cells. In the mucosa, a plexus of varicose fibers formed a meshwork in the lamina propria, the muscularis mucosa was sparsely innervated, and most of the blood vessels were not associated with adrenergic fibers.

3812 ABSENCE OF EFFECT OF MULTIPLE INTRAPERITONEAL INJECTIONS ON CELL PROLIFERATION, AND ESTIMATION OF THE CELL CYCLE TIME IN THE EPITHELIUM OF THE ESOPHAGUS AND FORESTOMACH IN MICE, HAMSTERS AND RATS. *(E.)* Blenkinsopp, W. K. (St. Mary Hosp. Med. Sch. London, England). *Cell Tiss Kinet* 3(1):83-88, 1970.

The proportion of nuclei labeled in the epithelium of the esophagus and forestomach, the cell cycle time, a the rate of proliferation of esophageal and forestoma epithelium were studied by autoradiography in mice, h sters and rats given single or multiple injections of tritiated thymidine. Counts of labeled epithelial ce nuclei in mice showed that multiple i.p. injections d not disturb normal cell proliferation. The rate of cell proliferation was the same in the epithelium of the esophagus and forestomach, and in these epithelia there was no difference between mice, hamsters and rats. Epithelial cell cycle times (estimated from th number of nuclei labeled) varied throughout the year. In the proliferating layer of epithelium, the growth fraction was considerably less than unity and sometimes was made up of two or more fractions with diffe ent cell cycle times.

3813 INFLUENCE OF PARTIAL HEPATECTOMY ON THE INDUCTION OF LIVER MICROSOMAL DRUG-METABOLIZING ENZYMES PRODUCED BY PHENOBARBITAL: A BIOCHEMICAL AND ULTRASTRUCTURAL STUDY. *(E.)* Chiesara, E. (Inst. Pharmacol. Ther., U. Milan, Italy), F. Conti and J. Meldolesi. *Lab Invest* 22(4):329-338, 1970.

The effect of partial hepatectomy on the time-course and amount of the induction of liver microsomal drug(hexobarbital and strychnine)-metabolizing enzymes produced by a single injection of phenobarbital was studied in female Sprague-Dawley rats. The rats received either an i.p. injection of phenobarbital (80 mg/kg) or an equivalent volume of saline, followed at various times by either partial hepatectomy or sham-operation. In hepatectomized rats treated with phenobarbital 12 hr before surgery, the induction of both strychnine- and hexobarbital-metabolizing enzymes showed a rapid increase in activity (from 150 to 200 γ of strychnine/gm of liver/hr, and from 110 to 150 γ of hexobarbital/gm of liver/hr) up to 36 hr following surgery, and a nearly parallel effect in the sham-operated rats. After 36 hr, the enzyme induction began to decrease in the sham-operated rats, reaching a level of nearly zero by the sixth day following surgery. By contrast, the regenerating livers in the partially hepatectomized rats continued to increase for about 72 hr following surgery (to 230 γ of strychnine/gm of liver/hr, and to 210 γ of hexobarbital/gm of liver/hr), and then decreased very slowly. By the 8th day following surgery, enzyme induction in the regenerating livers was still at a level of above 100 γ/gm of liver/hr for both strychnine and hexobarbital. The electron microscope examination of hepatectomized livers revealed that 8 days after surgery the characteristic ultrastructural changes of hypertrophy of the smooth endoplasmic reticulum, produced by phenobarbital, was still evident in most cells located toward the center of the lobule, while it had nearly disappeare in the corresponding cells of the sham-operated controls.

3814 ON THE MECHANISM OF HORMONE ACTION: XVI. TRANSFER OF [1,2-$^3H_2$] CORTISOL FROM THE CYTOPLASM TO THE NUCLEUS OF RAT-LIVER CELLS. *(E.)* Beato, M. (Rockefeller U. Bio-Med. Div., New York,

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he interaction *in vitro* of the complex ^{3}H-cortisol-ytosol macromolecules with purified liver nuclei rom adrenalectomized male Wistar BR II rats was tudied in order to elucidate the role of the cytolasmic factors in the transport of cortisol into he nucleus. The glycoprotein fraction which binds H-cortisol in the cytosol of rats was involved in he transport of the hormone into the cell nucleus nd in its binding to the nuclear macromolecules. his function could not be fulfilled by the same oncentration of bovine serum albumin. The binding f ^{3}H-cortisol to the cytosol macromolecules *in itro* showed characteristics very similar to those inding *in vivo*, such as the same specific activity, edimentation constant, and enzyme sensitivity. The inding reaction proceeded faster at 37°C than at 7°C or 4°C, but the saturation values reached were igher at a lower temperature. The presence of the ytosol macromolecules in the assay mixture allowed reduction on the order of 10^{2}-10^{3} in the optimal oncentration of cortisol required for the stimuation *in vitro* of RNA polymerase activity in isoated rat liver nuclei. The cytoplasmic cortisol eceptor seemingly facilitates the interaction of he hormone with the chromosomal proteins, resultng in increased transcription of rat liver chromain.

815 LIPID ANALYSIS OF PURIFIED SUBCELLULAR FRACTIONS OF RAT LIVER. *(E.)* Rahman, . E. (Argonne Nat. Lab., Ill.). *Argonne Nat Lab iol Med Res Div Ann Rept* 226-228, 1969.

ipid analysis (using methods such as thin-layer, olumn, and gas-liquid chromatography) of samples f well-characterized purified rat liver mitochonria, microsomes, and nuclei showed greatest conentration of neutral lipids in nuclei (major fatty cids are palmitic with an area percentage of 30.06, nd linoleic - 34.15). Phospholipid content (of otal lipid) was 50.6% in nuclei, 88.4% in mitochonria, and 78.6% in microsomes while cholesterol was .93% in nuclei, 2.80% in mitochondria, and 5.30% in icrosomes. The unusually low cholesterol figure or nuclei is due to contamination by plasma memrane and cholesterol seemingly might be unique to he plasma membranes.

816 INTESTINAL MAST CELLS IN POSTOPERATIVE MICROCIRCULATORY DISTURBANCES. *(E.)* Poka, .. (U. Med. Sch., Pecs, Hungary), L. Lukacs and J. erner. *Acta Chir Acad Sci Hung* 10(4):379-385, 1969.

lectron microscope studies of jejunal mucosa from 9 ogs (10 kg), following gastric surgery, showed ypoxic destruction of the absorptive cells but inact tissue mast cells of the lamina propria. Light icroscope studies showed intact mast cells in the dematous and congested layers of the small intestinal all. These experiments failed to reveal degeneraive processes of the mast cells in the post-trauatic microcirculatory disturbances and do not indiate that histamine liberation (or its complex formed ith heparin) plays a significant role here.

3817 PERSISTING EXTRANUCLEOLAR RNA SYNTHESIS IN THE LIVER OF RATS TREATED WITH LASIOCARPINE: A HIGH RESOLUTION AUTORADIOGRAPHIC STUDY. *(Fr.)* Monneron, A. (Dept. Biochem., Rockfeller U., New York, N. Y.) and N. Kerros. *Int J Cancer* 5(1): 55-63, 1970.

The synthesis of extranucleolar RNA in the liver of rats after a single i.p. injection of 80 mg/kg of lasiocarpine was studied by high resolution autoradiography after the administration of tritiated uridine. After washing away acid-soluble RNA-precursors, autoradiographs showed the persistence of nuclear RNA synthesis which was mainly extranucleolar. Grains were observed in the nucleoplasm, along the chromatin areas, and sometimes in the lasiocarpine-induced nuclear inclusions. RNA polymerase was affected by lasiocarpine to a greater extent in the nucleoli than at the sites of extranucleolar transcription.

3818 STUDIES ON ADENOSINE DEAMINASE IN MOUSE LIVER AND SPLEEN. *(E.)* Mustafa, S. J. (Industrial Toxic. Res. Ctr., Lucknow, India) and C. P. Tewari. *Enzymologia* 38(3):177-188, 1970.

Homogenates of liver and spleen from 6 months old male mice contained significant amounts of adenosine deaminase activity associated with particles. In both liver and spleen, although adenosine deaminase was predominantly a soluble enzyme the recovery from the subcellular fractions of enzymic activity which was in excess of the activity of the homogenate suggested that an inhibitor was associated with one or more fractions. In the liver studies, none of the three particulate (nuclear, "heavy"- and "light"-mitochondrial) fractions used singly led to any pronounced decrease in the activity of the supernatant fraction, but a marked inhibition (30%) occurred when all three were mixed together with the supernatant (10% lower activity than the original homogenate). In the spleen studies, mixing supernatant fraction with the nuclear fraction caused little change, but the mitochondrial fractions resulted in activation of enzymic activity. Treatment with Triton X-100 led to potentiation of the inhibitory activity of liver heavy mitochondria and enhanced the activating effect of spleen light mitochondria when freezing preceded the (Triton X-100) treatment.

3819 THE REGULATION OF XANTHINE OXIDASE: INHIBITION BY REDUCED NICOTINAMIDE-ADENINE DINUCLEOTIDE OF RAT LIVER XANTHINE OXIDASE TYPE D AND OF CHICK LIVER XANTHINE DEHYDROGENASE. *(E.)* Della Corte, E. (Inst. Gen. Path., U. Bologna, Italy) and F. Stirpe. *Biochem J* 117(1):97-100, 1970.

Assays of xanthine oxidase (type D) from the livers of normal Wistar rats showed that the reaction rate in the presence of NAD^{+} decreased shortly after the beginning of the reaction. When pyruvate and lactate dehydrogenase were added to the reaction mixtures to remove the NADH produced by the reaction, the declining reaction accelerated and proceeded at the initial or even at a faster rate until the substrate was consumed. Experiments performed at various concentrations of xanthine demonstrated that NADH did not compete with the substrate. The xanthine oxidase (type O) activity of fresh supernatant or of trypsin-treated supernatant was not affected by NADH or by the addition of pyruvate and lactate dehydrogenase. NADPH did not affect the type D reaction, and NADP$^+$ did not substitute for NAD$^+$ as acceptor. Similar experiments were performed with chick liver preparations and inhibition by NADH was observed that was competitive for NAD$^+$ and not for xanthine. Compared with chick liver xanthine dehydrogenase, the rat liver enzyme had a lower K_m for xanthine, a higher K_m for NAD$^+$ and a similar K_i for inhibitory NADH. In assays of xanthine oxidase (type D) from rat liver and xanthine dehydrogenase from chick liver, the addition of pyruvate and lactate dehydrogenase removed NADH formed, preventing inhibition of the enzyme.

3820 HISTOCHEMICAL STUDIES OF SMALL AND LARGE BOWELS: III. THE EFFECTS OF ANTI-TUMOR AGENTS, COLCHICINE AND GAMMA-RAY IRRADIATION ON THE GASTROINTESTINAL TRACT OF SMALL LABORATORY ANIMALS. *(E.)* Iwai, N. (Fac. Med. Kyoto U., Japan). *Jap Arch Intern Med* 16(7):275-290, 1969.

Wistar albino rats and Dd/s mice were used to study the histological and histochemical effects of 4 anti-tumor agents (mitomycin C, 5-fluorouracil, cytosine arabinoside, and methotrexate), as well as cholchicine and gamma-ray irradiation on the small and large intestine. Of the 4 anti-tumor agents, 5-fluorouracil seemed to produce maximal damage, and cytosine arabinoside produced the least amount of damage. When a single dose was given, mitomycin C produced the severest changes, while the other 3 agents had almost no effect. All 4 agents produced similar morphological changes and had their principal effect on the mitochondrial enzymes, particularly the dehydrogenases. Colchicine arrested mitosis and at the same time reduced the enzyme activities of the small intestine. These changes were most evident in rats receiving large doses (1.5 mg/kg) for 3 successive days. Gamma-ray irradiation (900 r) produced villous atrophy in the small intestine of mice, but the reduction of enzyme activities was slight compared with the histological changes.

3821 HEPATOCYTES CULTIVATED IN THE PRESENCE OF A PROTEIN YEAST CONCENTRATE. *(Fr.)* Verne, J. (Fac. Med. Paris, France), S. Hebert and N. Richshoffer. *Bull Acad Nat Med* 153(28-29):470-473, 1969.

3822 STUDIES ON MAST CELLS IN GASTRIC MUCOSA: I. MAST CELL IN NORMAL GASTRIC MUCOSA. *(Jap.)* Imoto, S. (Shinko Hosp., Kobe, Japan). *Jap Arch Intern Med* 16(8):335-343, 1969.

3823 THE GLUCOSE-6-PHOSPHATE-DEHYDROGENASE AND 6-PHOSPHOGLUCONIC DEHYDROGENASE ENZYME ACTIVITY OF ENTERIC MUCOSA IN PATIENTS WITH ERYTHROCYTE ENZYME DEFICIENCY: HISTOCHEMICAL FINDINGS. *(E.)* Celle, G. (Sci. Inst. Intern. Med., U. Genoa, Italy) and M. Dodero. *Acta Gastroent Belg* 32(12):948-953, 1969.

3824 THE SYNTHESIS AND TURNOVER OF RAT LIVER PEROXISOMES: III. THE SIZE DISTRIBUTIO AND THE INCORPORATION OF NEW CATALASE. *(E.)* Poole B. (Rockefeller U., New York, N.Y.), T. Higashi an C. DeDuve. *J Cell Biol* 45(2):408-415, 1970.

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3829 COLLAGEN ACTIVITY IN RAT LIVER. *(Jap.)* Hiroshige, K. (3rd Dept. Med., Kyushu U., Fukuoka Japan). *J Jap Biochem* 41(12):827-836, 1970.

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3834 INCREASE OF LIVER TRANSALDOLASE IN THE HYPERTHYROID RAT. *(It.)* Fossa, T. (Inst. Biol. Chem., U. Turin, Italy). *Boll Soc Ital Biol Sper* 45(9):560-561, 1969.

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3848 SURGICAL ANATOMY OF THE LIVER. *(E.)* Elias, H. (no affil). *Recent Results Cancer Res* 26:116-136, 1970.

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3857 THE LIVER ENZYME SYSTEM CATALYZING N-ACETYL MANNOSEAMINE BIOSYNTHESIS FROM UDP-N-ACETYLGLUCOSEAMINE: THE ACTION OF CORTISOL. *(It.)* Penati, M. R. (Inst. Chem. Biol., U. Milano, Italy), A. Pagani and V. Zambotti. *Boll Soc Ital Biol Sper* 45(2):102-105, 1969.

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3860 THE STIMULATION AND FUNCTION OF THE SE TONIN PRODUCING ENDOCRINE CELLS OF THE RABBIT STOMACH. *(Ger.)* Ratzenhofer, M. (Path. I U. Graz, Germany). *Z Gastroent* 7(6):464-471, 19

3861 EFFECTS OF BUTYLATED HYDROXYTOLUENE ON ENZYME ACTIVITY AND ULTRASTRUCTURE OF HEPATOCYTES. *(E.)* Botham, C. M. (Indust. Hyg. R Lab., Cheshire, England), D. M. Conning, J. Haye M. H. Litchfield and T. F. McElligott. *Food Cos Toxic* 8(1):1-8, 1970.

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- P:Secr:Stom (3913) (3914)
- P:Secr:Hepatobil (3933) (3935) (3940) (3941) (3961) (3963) (3971) (3973) (3981) (3983) (3986) (3987) (3988) (3989)
- P:Secr:Int (3993)
- Diagproc (4042) (4045) (4049) (4052) (4069) (4082)
- D:Esoph (4092) (4123)
- D:Stomduo (4129) (4145) (4148) (4152) (4157) (4181)
- D:Stomduo:Peptulc (4208)
- D:S.Intest (4232)
- D:S.Intest:Regent (4243)
- D:L.Intest (4267) (4303)
- D:L.Intest:Ulccol (4321)
- D:Pancreas (4338)
- D:Livbil (4368) (4372) (4379) (4381) (4383) (4388) (4391) (4396) (4408) (4425) (4431) (4432) (4434) (4435) (4438)
- D:Livbil:A.Nonv.Hep (4443) (4444) (4449) (445 (4452) (4453) (4454) (4456) (4460) (4462) (4463) (4466) (4468) (4469) (4471)
- D:Livbil:A.V.Hep (4476) (4482) (4484)
- D:Livbil:Gallb (4531) (4538)
- D:Gen (4565) (4572) (4573) (4574) (4608) (461 (4636) (4653)

ABSORPTION–EXCRETION–TRANSPORT

3862 IONIC DETERMINANTS OF ELECTRICAL POTENTIAL IN THE *IN VIVO* SMALL INTESTINE. *(E.)* Jacobson, E. D. (U. Oklahoma Med. Ctr., Oklahoma City), A. C. Brown and R. L. Vick. *Gastroenerology* 58(3):363-370, 1970.

The transmucosal potential difference of the rat jejunum *in vivo* was determined from measuring sites in the jejunal lumen and the venous blood. The values obtained were comparable with those employing a serosal electrode in the peritoneal cavity. The transmucosal potential difference was influenced by the concentration of all the univalent ion species tested (Na^+, K^+, Li^+, Cl^-, and HCO_3^-), with cations having a greater effect than the anions. In the range of 50 to 150 mEq/liter, the potential was related linearly to the logarithm of the concentration for each ion and the potential differences result from ionic mixtures could be predicted from a lin combination of the potentials associated with the dividual ions. The effect of concentration on tr mucosal potential difference seemingly is a direc reflection of the relatively large and nonspecifi passive permeability of the jejunal mucosa.

3863 EFFECT OF BILE SALTS ON THE GASTROINTES ABSORPTION OF DRUGS. *(E.)* Kakemi, K. (Pharm. Sci., Kyoto U., Japan), H. Sezaki, R. Koni T. Kimura and M. Murakami. *Chem Pharm Bull* 18(2) 275-280, 1970.

The effects of sodium taurocholate and sodium gly cholate on drug absorption from the rat small in-

tine were investigated using the *in situ* perfusion
hnique. The absorption of sulfanilamide was not
ected, but the absorption of sulfaguanidine and
nol red (poorly absorbable drugs) were enhanced
the bile salts above their critical micellar con-
trations. The absorption of 2-allyloxy-4-chloro-
2-diethylaminoethyl)benzamide hydrochloride was
ibited by bile salts above the critical micellar
centration. Three likely mechanisms given for
effect of bile salts on drug absorption are:
the loss of thermodynamic activity of a drug due
the formation of the micellar complex; 2) the
al concentration build-up effect such as an
umulation on the absorptive surface, and 3) the
ect effect on the permeability characteristics
the intestinal mucosa.

54 THE EFFECT OF SECRETIN ON ELECTRICAL POTENTIAL DIFFERENCES IN THE PANCREATIC DUCT.
) Way, L. W. (Sch. Med. U. California, San
ncisco) and J. M. Diamond. *Biochim Biophys Acta*
(2):298-307, 1970.

ing free flow of pancreatic juice and during per-
ion of the pancreatic duct with simple salt solu-
ns, measurements were made of the electrical po-
tial differences between the major pancreatic duct
blood of anesthetized cats. The measured poten-
l differences were corrected for junction poten-
ls. During free flow the hormone secretin shifted
pancreatic duct electrical potential in the nega-
e direction by 7 mV, approximately in phase with
secretin-stimulated juice flow. During perfusion
h salt solutions, secretin shifted the pancreatic
t potential difference in the negative direction
about 3 mV, independent of the composition of the
t solution used. Relative ionic permeability co-
icients for Na$^+$, K$^+$, Cl$^-$, and HCO$_3^-$ in the pan-
atic duct were calculated from diffusion potentials
were unaffected by secretin. The ion fluxes
mulated by secretin were up the electrochemical
dient for HCO$_3^-$ and down the gradient for Na$^+$, K$^+$,
Cl$^-$. The secretin-induced changes in potential
ference during free flow apparently is partly the
ult of a change in diffusion potential and partly
to the direct effect of active ion transport.

55 *IN VITRO* STUDIES ON THE "AVAILABILITY" OF DRUGS: I. ABSORPTION FROM THE GASTRO-
TESTINAL TRACT. *(Ger.)* Stricker, H. (C. H.
ehringer, Ingelheim, Germany). *Arzneimittelfor-
hung* 20(3):391-396, 1970.

model for *in vitro* absorption from the gastro-
testinal tract is described together with the con-
ruction and properties of some artificial lipid
rriers. The barrier 1180 containing caprylic acid
the separating layer between the buffer solutions
different pH values is, on the one hand, largely
penetrable to hydrogen and hydroxyl ions, and, on
e other, it is selectively permeable to several
ganic drugs. The diffusion coefficients of acid,
sic and amphoteric organic drugs from synthetic
stric juice into artificial plasma, through barrier
80, were determined and compared with corresponding
udies *in vivo* by other investigators, and found to
in good agreement.

3866 SITE OF IRON ABSORPTION IN MAN. *(E.)* Wheby, M. S. (U. Virginia Sch. Med., Charlottesville). *Scand J Haemat* 7(1):56-62, 1970.

The site of iron absorption in the small intestine was studied in 8 normal subjects and 9 iron-deficient patients in whom either ^{59}Fe or ^{55}Fe was given with 5 mg of carrier iron (one isotope by mouth and the other by tube) on alternate days for 6 days. After two weeks, red cells were assayed for each isotope and the ratio of the isotope given orally to the isotope given by tube was determined (this ratio reflected the effect of bypassing preselected gastrointestinal segments). Iron was absorbed along the entire length of the small intestine but when the doses of iron were placed by tube into the proximal jejunum of normal subjects absorption was decreased by as much as 50% compared to absorption following the oral dose Iron abosrption in the small intestine proximal to the mid-jejunum was more efficient than that in distal portion in normal subjects while abosrption was enhanced from the distal segment to the mid-jejunum in iron-deficient patients. The ratio for the abosrption of 5 mg iron labeled with ^{55}Fe and ^{59}Fe ranged from 0.08 to 0.95 in iron-deficient patients and from 0.31 to 0.92 (tube administration:oral) in normal subjects.

3867 LOCALIZATION OF LIPID REESTERIFYING ENZYMES OF THE RAT SMALL INTESTINE: EFFECTS OF JEJUNAL REMOVAL ON ILEAL ENZYME ACTIVITIES. *(E.)* Rodgers, J. B., Jr. (Albany Med. Coll., N.Y.) and W. Bochenek. *Biochim Biophys Acta* 202(3):426-435, 1970.

Lipid absorption was studied in male rats by measuring the uptake and esterification of (I-^{14}C) oleic acid by everted sacs from the jejunum and terminal ileum, and assaying for two of the lipid reesterifying enzymes (fatty acid-CoA lipase and acyl-CoA:monoglyceride acetyltransferase) at the various levels of the small bowel. Uptake and esterification of (I-^{14}C) oleic acid as well as the activity of the two reesterifying enzymes were significantly greater in sacs prepared from the proximal small bowel. The values in μmoles of oleic acid per g wet wt. of sac for uptake were 2.43 for jejunum and 1.45 for ileum, and for esterification were 1.97 for jejunum and 1.04 for ileum. Enzyme activities were elevated in the ileum of rats in which the jejunum was surgically removed or bypassed one month before assay. Total enzyme activities were more increased compared to the specific activities because of the hypertrophic effects produced in the remaining ileum following removal of the jejunum. The results support the concept that the proximal small bowel is the major site of lipid absorption under normal conditions but that the ileum has the potential to absorb lipid if the jejunum is removed.

3868 PHYSIOLOGIC SURFACE-ACTIVE AGENTS AND DRUG ABSORPTION: VII. EFFECT OF SODIUM DEOXYCHOLATE ON PHENOL RED ABSORPTION IN THE RAT. *(E.)* Feldman, S. (Temple U. Sch. Pharm., Philadelphia, Penn.), M. Salvino and M. Gibaldi. *J Pharmaceut Sci* 59(5):705-707, 1970.

3869 ORAL IRON THERAPY. *(E.)* Callender, S. T. (Radcliffe Inf., Oxford, England. *Brit J Haemat* 18(2):123-125, 1970.

3870 THEORETICAL MODEL STUDIES OF DRUG ABSORPTION AND TRANSPORT IN THE GASTROINTESTINAL TRACT: I. *(E.)* Suzuki, A. (Osaka, Japan), W. I. Higuchi and N. F. H. Ho. *J Pharmaceut Sci* 59(5):644-651, 1970.

3871 THEORETICAL MODEL STUDIES OF DRUG ABSORPTION AND TRANSPORT IN THE GASTROINTESTINAL TRACT: II. *(E.)* Suzuki, A. (Osaka, Japan), W. I. Higuchi and N. F. H. Ho. *J Pharmaceut Sci* 59(5):651-659, 1970.

3872 TRANSPORT AND PHOSPHORYLATION OF 2-DEOXI-D-GLUCOSE IN THE RAT ANUS MUSCLE: TESTOSTERONE, INSULIN, ANEROBIOSIS AND DIRECT STIMULATION. *(It.)* Bergamini, E. (Inst. Gen. Path. U. Siena, Italy). *Boll Soc Ital Biol Sper* 45(6): 493-497, 1969.

3873 A GLYCOPEPTIDE COMPONENT OF HUMAN COLOSTRUM. *(It.)* Vignati, E. (Inst. Chem. Biol., U. Milan, Italy), A. Sassi, M. R. Penati, U. Formica and M. Marconi. *Boll Soc Ital Biol Sper* 45(2):105-108, 1969.

3874 LIPID ABSORPTION IN CASE OF INTESTINAL OCCLUSION. *(It.)* Grosso, G. (Civ. Hosp. Genoa, Italy) and A. Amici. *Rass Arch Chir* 7(4): 143-149, 1969.

3875 EFFECT OF MILK ON HEPATIC CLEARANCE IN MAN. *(Fr.)* Charbonnier, A. (Ctr. Hosp. U. Cochin, Paris, France), J. Perrin and M. Lahellec. *Nutr Dieta* 11(4):293-302, 1969.

3876 ABSORPTION OF GLUCOSE AND LACTIC ACID BY EVERTED INTESTINAL LOOPS IN THE RAT AFTER INTRAPERITONEAL INJECTION OF ALCOHOL. (*Fr.*) Griffaton, G. (I.N.S.E.R.M., Paris, France), F. Faudemay, C. Sautier and R. Lowy. *Nutr Dieta* 11(4): 259-269, 1969.

3877 ACTIVE TRANSPORT OF *MYO*-INOSITOL AND ITS RELATION TO THE SUGAR TRANSPORT SYSTEM IN HAMSTER SMALL INTESTINE. *(E.)* Caspary, W. F. (Med. U. Clin., Gottingen, Germany) and R. K. Crane. *Biochim Biophys Acta* 203(2):308-316, 1970.

3878 SILICA: INTESTINAL ABOSRPTION AND BLOOD TRANSPORT IN THE ADRENALECTOMIZED RAT. *(Fr.)* Charnot, Y. (Fac. Sci. Lyon, France), Y. Martin and G. Peres. *C R Soc Biol* 163(6):1398-140 1969.

3879 ABSORPTION AGAINST CONCENTRATION GRADIEN OF THIAMINE IN THE RAT INTESTINE *IN VIVO* *(It.)* Sciorelli, G. (Inst. Human Physiol., U. Pavia, Italy) and U. Ventura. *Acta Vitamin Enzym* 23(6):231-233, 1969.

3880 EFFECT OF SOME STRUCTURAL ANALOGS OF THIAMINE ON ITS ABSORPTION AGAINST CONCENTRATION GRADIENT *IN VIVO* IN THE RAT. *(It.)* Sciorelli, G. (Inst. Human Physiol., U. Pavia, Italy) and U. Ventura. *Acta Vitamin Enzym* 23(6):234-237, 1969.

3881 THE EFFECT OF DRUG ANTIMITOTIC ACTIVITY GLUCOSE LEVELS IN THE INTESTINE. *(Ger.)* Hadnagy, Cs. (2nd U. Med. Clin. Marosvasarhely, Rumania), T. Csipkes, J. Szekley and L. Rott. *Z Gastroent* 8(6):472-473, 1969.

3882 THE INFLUENCE OF CaNa$_2$ EDTA ON IRON ABSORPTION IN RABBITS (STUDIES WITH ^{59}Fe). *(Pol.)* Sroczynski, J. (Acad. Med. Poland), G. Jonderko, F. Kumaszka and A. Wegiel. *Pat Pol* 20(4):445-454, 1969.

- P:Motil (3798)
- P:Secr:Stom (3905)
- Diagproc (4041)
- D:S.Intest:Malabs (4248)
- D:Livbil:A.Nonv.Hep (4447)
- D:Livbil:A.V.Hep (4494)
- D:Livbil:Cirrh (4523)
- D:Livbil:Gallb (4535)
- D:Gen (4595) (4613) (4653) (4655)

383 STUDIES OF THE "GASTROESOPHAGEAL SPHINCTER
MECHANISM": THE ROLE OF THE PHRENOESOPHA-
AL MEMBRANE. *(E.)* Bremner, C. G. (Mayo Grad. Sch.
d., U. Minnesota, Rochester), J. F. Schlegel and
H. Ellis, Jr. *Surgery* 67(5):735-740, 1970.

e role of the phrenoesophageal membrane in main-
inence of inferior esophageal sphincteric pressure
d competence was studied manometrically and cine-
uorographically in 19 dogs after a series of experi-
ntal procedures (division of the membrane, its di-
sion and reattachment at different levels, and
cision of a ring of diaphragmatic crural muscle).
hincteric pressures were not altered significantly
the experimental procedures. The sphincter was
ortened when surgically separated from the dia-
ragm and when a ring of hiatal muscle was excised.
stroesophageal reflux was detected radiographically
only 2 of the 19 animals. The phrenoesophageal
mbrane seemingly does not play a significant role
the function of the inferior esophageal sphincter
the dog, although it may provide structural sup-
rt for maintenance of its normal anatomic position.

384 CONFIGURATION AND FREQUENCY GRADIENT OF
ELECTRIC SLOW WAVE OVER CANINE SMALL BOWEL.
.) Szurszewski, J. H. (Mayo Grad. Sch. Med., U.
innesota, Rochester), L. R. Elveback and C. F. Code.
ner J Physiol 218(5):1468-1473, 1970.

determine changes in configuration and frequency
the slow wave (pacesetter potential) over the
ength of the small bowel of conscious healthy dogs,
0 platinum electrodes were sewn to the small bowel
t intervals between the pylorus and the ileocecal
unction of each dog, and recordings were made at
bout weekly intervals for 3 months. The configura-
ion of the pacesetter potential was complex, but
till consistent over the duodenum and upper jejunum
nd was most variable and sometimes absent in ileal
ecordings (but when present it was sinusoidal). All
ogs displayed a "frequency plateau" over the first
0 to 116 cm of orad bowel within which the pace-
etter potential did not vary by more than 0.1 cycle/
in, and the range of frequencies in different dogs
as 18.2 to 19.9 cycles/min. Caudad to the plateau
he frequency declined to 13.3 to 14.8 cycles/min
n the terminal ileum and in about 40% of 121 tests,
he decline was directly related to distance from
he pylorus. Sometimes a secondary frequency plateau
ccurred in the caudal bowel, but its site and length
ere variable.

885 EFFECTS OF PROPYLENE GLYCOL ON THE INTES-
TINAL SMOOTH MUSCLES OF EXPERIMENTAL ANI-
ALS. *(E.)* Shah, D. S. (Munic. Med. Coll. Ahmedabad,
ndia). *Indian J Physiol Pharmacol* 13(3):147-151,
969.

he effects of propylene glycol were studied on
uinea-pig ileum in which contractions were induced
y histamine, 5-hydroxytryptamine and acetylcholine
nd on rabbit jejunum in the presence of alpha and
eta blocking agents (tolazoline and propranolol).
ropylene glycol inhibited the effects of histamine,
-hydroxytryptamine and acetylcholine on guinea-pig
ileum and this effect was more pronounced at higher concentrations (0.02 ml/ml) and at greater time intervals of exposure to propylene glycol. Recovery from the effect of propylene glycol was quicker with 5-hydroxytryptamine (10 min) than with acetylcholine (20 min). In rabbit jejunum, propylene glycol (1.29×10^{-3} to 10.36×10^{-3} g/ml) decreased the height of pendular movement without any change in muscle tone and at higher concentrations (20.72×10^{-3} g/ml), the pendular movement was inhibited completely and the tone was decreased. Recovery of the rabbit jejunum from the effects of propylene glycol was immediate and the inhibitory effect of propylene glycol on rabbit jejunum was seen even in the presence of tolazoline and also propranalol, which completely blocked the relaxant effect of epinephrine.

3886 FLUID DYNAMICS IN VOLUMOGENIC DIARRHEA. *(E.)* Grantham, R. N. (U. Oklahoma Med. Ctr., Oklahoma City), G. A. Brecher and E. D. Jacobson. *Digestion* 3(1):1-12, 1970.

Intestinal motility patterns and the role of intestinal sphincters were studied in 13 dogs which received fluid infusions via the duodenum to produce diarrhea. A rise in ileal pressure without a change in colonic pressure occurred in 9 dogs in which the ileocecal sphincter appeared closed initially. After a variable period of time, during which ileal pressures continued to rise, the sphincter opened and colonic pressure began to increase. After initial ileocecal opening, as evidenced by a decline in ileal pressure and an increase in colonic pressure, the sphincter either remained opened or opened intermittently and independently of colonic pressure and action at the anus. Fluid that entered the colon through the ileocecal sphincter eventually caused distension of the rectum and relaxation of the anal sphincters evoking diarrhea. In 8 of the 13 dogs the ileocecal sphincter appeared to play a role in controlling diarrhea; in 9 dogs the anal sphincters controlled diarrhea exclusively or played the major role in its control. During the period of intermittent diarrhea, opening of both ileocecal and anal sphincters occurred frequently. Thus, four patterns of action were discerned in the development of volumogenic diarrhea: 1) the anal sphincter was open and the ileocecal sphincter prevented diarrhea; 2) the ileocecal sphincter and anal sphincters acted independently both preventing diarrhea to some extent; 3) the ileocecal sphincter was open and the anal sphincter prevented diarrhea; and 4) diarrhea occurred when the ileocecal sphincter was closed because of spontaneous colonic motility. Pattern 3 occurred most frequently. Duplication of these patterns was accomplished with a physical analogue constructed from Penrose tubing and clamps to stimulate the intestines and the sphincters.

3887 SPONTANEOUS ACTIVITY OF ISOLATED SMOOTH MUSCLE PREPARATIONS FROM DIFFERENT REGIONS OF THE GUINEA-PIG STOMACH. *(Ger.)* Golenhoffen, K. (Physiol. Inst. U. Marburg, Germany), D. Von Loh and K. Milenov. *Pflugers Arch* 315(4):336-356, 1970.

Electrical activity and development of mechanical tension of smooth muscle preparations from fundus, corpus, and antrum of guinea pig stomach was recorded with extracellular electrodes, and with microelectrodes intracellularly. Fundal muscle shows a tonic type of spontaneous activity, fast regular electrical oscillations with a frequency of about 60/min (second rhythm) which carry the spikes and trigger the development of mechanical tension. This basic tonic activity is modulated by slower rhythms: a minute-rhythm, lasting 1 to 3 min and very slow fluctuations lasting up to 1 hr (hour-rhythm). Oscillations in the peristaltic rhythm (4 to 5/min) are weak or absent in fundal preparations. The peristaltic rhythm is stronger in the distal muscles, and is characterized by fluctuations of the basic membrane potential (amplitudes up to 35mV in antrum muscle). The spontaneous activity is myogenic and is not blocked by atropine or tetrodoxin. Peristalsis in the stomach seemingly is myogenic and apparently originates in the tonic activity of the fundus.

3888 RELATIONSHIPS BETWEEN ELECTRICAL AND MECHANICAL ACTIVITIES OF THE DUODENO-JEJUNAL LOOP OF THE CAT. *(E.)* Abbadessa, S. (Inst. Physiol. Gen., U. Palermo, Italy), I. Di Gregorio and G. Gravante. *Arch Fisiol* 66(4):317-334, 1969.

The relation between electrical and mechanical activities of the duodeno-jejunal loop was studied in cats using *in vivo* macroelectrodes. Electrical activity consisted of slow rhythmic potentials and rapid spike deflections. The slow rhythmic electrical activity was constantly present and was independent of the parietal muscle's mechanical activity while the spike potential showed a close correlation with the mechanical activity of the duodeno-jejunal loop and more particularly with the large waves of contraction. Rapid spike deflections occurred in definite phases of slow rhythmic potentials indicating a close correlation between both activities. The greatest frequency of contraction in the duodeno-jejunal loop was never higher than the frequency of the slow potentials. The morphology and frequency of duodeno-jejunal loop slow rhythmic electrical activity was not altered by anesthesia or i.v. administration of nicotine. Complete transection of the duodeno-jejunal loop resulted in total dissociation of the slow rhythmic electrical activity.

3889 REFERENCE ELECTRODE SITES IN DETERMINATION OF POTENTIAL DIFFERENCE ACROSS THE GASTROESOPHAGEAL MUCOSAL JUNCTION. *(E.)* Grantham, R. N. (Mayo Clin., Rochester, Minn.), C. F. Code and J. F. Schlegel. *Mayo Clin Proc* 45(4):265-274, 1970.

Potential difference and pressure profiles of the gastroesophageal junction were obtained using the finger, unabraded skin of the volar surface of the forearm, abraded forearm, lancet puncture of the forearm, subcutaneous tissues, and the bloodstream (i.v.) as sites for the reference electrode in 10 healthy persons. The potential difference profiles using lancet puncture of the forearm, subcutaneous, and intravenous reference sites were similar. The most definitive potential difference profile of th gastroesophageal junctional zone was obtained usin the i.v. site for the reference electrode and the finger provided the least accurate reference site, both for absolute values of potential difference and for sharpness of definition of the junctional zone. The lancet puncture was the simplest and most acceptable substitute for an i.v. reference electrode in routine diagnostic studies.

3890 HORMONAL CONTROL OF GASTROESOPHAGEAL-SPHINCTER STRENGTH. *(E.)* Castell, D. O. (U. Hosp., Boston, Mass.) and L. D. Harris. *New Eng J Med* 282(16):886-889, 1970.

To test the possibility that the esophagus is protected during periods of increased gastric acidity by more forceful contraction of the lower esophageal sphincter, pressures were measured during routine gastric analysis and following the administration of betazole hydrochloride. Patient having routine analysis with betazole as the stimu lating agent showed a consistent increase in sphincter pressure that closely paralleled the increase in gastric hydrogen ion activity; however this rise was not due to the simple presence of acid in the stomach because sphincter pressure decreased consistently when 0.1 N hydrochloric acid was instilled into the stomach of normal subjects (increases in sphincter pressure were noted when alkali was instilled into the stomachs of the same subjects). Within 2 min after s.c. injection of pentagastrin (1 μg/kg), sphincter pressure began to rise, reaching a peak by 7 min, and returning to preinjection levels by 30 min. A possible physiologic action of gastrin seemingly may exist for regulating lower esophageal sphincte pressure.

3891 EXUDATE AND MOTILITY OF THE INTESTINAL VILLI. *(E.)* Ihasz, M. (U. Med. Sch., Budapest, Hungary), J. Karika, I. Koiss and G. Ludany. *Agressologie* 10(6):479-483, 1969.

The effect of a heparin-containing sterile exudate (produced by intrapleural application of turpentin on motility of intestinal villi was studied in 16 narcotized dogs *in situ*. Exudates, transudates an blood plasma applied directly to the mucosa had no effect while injection of sterile exudate into the mesenteric artery (1 ml/min) produced within 30-60 sec an increase in the tonus of the villous muscle during which the villous bodies shortened; capilla contraction and a decrease in motility was also ob served (these results were readily reversible). There were no changes in the arterial blood pressu nor in intestinal peristalsis. An increase in the amount of the sterile exudate administration (2 ml min) was necessary to produce the same effect when injected in a thicker, supernatant punctate of the thoracic cavity. Leukotaxin (protein hydrolysate prepared from the sterile exudate), at 1 ml/min, produced a slight increase in villous automatism (the hyrolysate preparation had a very low histami content which was felt to have no effect on the in crease).

892 THE ACTION OF SELECTED METAL COMPLEXES ON RECEPTOR SYSTEMS OF ISOLATED ORGANS: I. HE ACTION OF SELECTED RUTHENIUM (II) PHENANTHROLINE HELATES ON THE CHOLINERGIC MECHANISM OF THE RAT NTESTINE AND GUINEA PIG ILEUM. *(E.)* Shulman, A. Dept. Pharmacol., U. Melbourne, Victoria, Austraia), G. M. Laycock, E. J. Ariens and A. R. H. igmans. *Europ J Pharmacol* 9(3):347-357, 1970.

tropine, lachesine, hexamethonium, hemicholinium-, nicotine, eserine, morphine and procaine were sed in a study of tris(3,5,6,8-tetramethyl-1,10-henanthroline)ruthenium(II) chloride (RTMP) and ris(1,10-phenanthroline)ruthenium(II) iodide (RP) n segments of ileum excised from male and female dult guinea-pigs. RTMP and RP were shown to have he following actions on the cholinergic mechanism f the guinea-pig ileum: 1) an indirect cholinoimetic action, probably at the postganglionic erve terminals, resulting in spasmogenic action ue to liberated ACh, 2) a ganglion blocking action,) a reversible competitive cholinolytic action and ossibly, 4) an inhibitory action on cholinesterase nd choline uptake. The rat intestine was much ore refractory than the guinea-pig ileum to the ndirect cholinomimetic action of the metal cheates but was equally sensitive to their cholinoytic action. These multiple effects on the holinergic mechanisms were remarkable since RTMP nd RP contain no localized area of high charge ensity or other characteristics present in the ore usual types of cholinergic and anti-cholinergic rugs.

893 INHIBITION OF GASTRIC EMPTYING BY ENDOTOXIN (BACTERIAL LIPOPOLYSACCHARIDE) IN ONSCIOUS RATS AND MODIFICATION OF THIS RESPONSE BY RUGS AFFECTING THE AUTONOMIC NERVOUS SYSTEM. *(E.)* an Miert, A. S. J. P. A. M. (Inst. Vetr. Pharmacol. oxicol., St. U. trecht, Netherlands) and D. A. e La Parra. *Arch Int Pharmacodyn Ther* 184(1):27-3, 1970.

he influence of blockade of the sympathetic nervous ystem and stimulation of the parasympathetic nervous ystem at different levels on the inhibition of gasric motility by bacterial lipopolysaccharide was tudied in male and female rats. After adrenalectomy r pretreatment with insulin or reserpine, the gasric emptying rate was increased. Administration of acterial lipopolysaccharide strongly inhibited gasric emptying and this inhibitory effect was completely blocked by pretreatment with carbachol and as antagonized by insulin hypoglycemia, by adrenalctomy and by reserpine. Adrenergic blocking drugs (Dibenamine, propranolol, phentolamine) which alter atecholamine synthesis were not effective antagonists of the effect of bacterial lipopolysaccharide. drenergic mechanisms may be relatively unimportant in the inhibition of the gastric emptying rate.

3894 ELECTRIC ACTIVITY OF THE HUMAN AND ANIMAL SMALL INTESTINE. *(It.)* Di Martino, L. (Med. Dept. U. Catania, Italy), M. Pisano and L. Provenzale. *Boll Soc Ital Biol Sper* 45(12): 822-825, 1969.

3895 THE ELECTRIC ACTIVITY OF THE COLON IN MAN: THE GASTRO-COLIC REFLEX. *(It.)* Pisano, M. (Med. Dept. U. Catania, Italy), L. Di Martino and L. Provenzale. *Boll Soc Ital Biol Sper* 45(12):829-832, 1969.

3896 THE CHOLECYSTOKINETIC ACTION OF CERULEIN IN DOGS. *(It.)* Agosti, A. (Inst. Pharm. Clin. Med. Vetr. U. Parma, Italy) and G. Zannetti. *Boll Soc Ital Biol Sper* 45(5):297-300, 1969.

3897 ESOPHAGEAL MOTILITY. *(E.)* Connell, A. M. (Roy. Victoria Hosp., Belfast, Ireland). *Brit J Hosp Med* 3(3):365-372, 1970.

3898 EXTRINSIC NERVOUS CONTROL OF COLONIC MOTILITY AND BLOOD FLOW: AN EXPERIMENTAL STUDY IN THE CAT. *(E.)* Hulten, L. (Dept. Surg., U. Goteborg, Sweden). *Acta Physiol Scand* (supp. 335):1-116, 1969.

3899 THE ACTIVITIES OF α- AND β-ADRENOCEPTIVE BLOCKING AGENTS IN REDUCING INTESTINAL RELAXATION DUE TO SYMPATHETIC STIMULATION IN THE PITHED RAT. *(E.)* Parkes, M. W. (Roche Products, Welwyn Garden City, Herts., England) and C. A. Gerrard. *J Pharm Pharmac* 22(3):189-192, 1970.

3900 RADIOLOGICAL STUDIES ON THE EFFECT OF 1,1-DIETHYL-3-(DIPHENYLMETHYLENE)-2-METHYL PYRROLIDINIUM BROMIDE (PRIFINIUM BROMIDE) ON MOTILITY OF GALLBLADDER. *(Jap.)* Inoue, H. (Kyoto U. Med,, Japan), S. Tabuchi and H. Andachi. *Jap Arch Intern Med* 16(11):427-434, 1969.

3901 RESPIRATORY ACIDOSIS AND THE INTESTINAL INHIBITORY EFFECT OF CATECHOLAMINES. *(Fr.)* Baisset, A. (Fac. Med. Toulouse, France) and M. A. Tran. *C R Soc Biol* 163(6):1449-1455, 1969.

3902 ANIMAL AND HUMAN ELECTRIC POTENTIALS IN THE ABDOMINAL WALL AS RELATED TO THE ANTRAL AND PYLORIC ACTIVITY. *(Fr.)* Martin, A. (C. H. R. Bretonneau, Tours, France), J. Moline and J. Thouvenot. *C R Soc Biol* 163(6):1423-1425, 1969.

- P:Absorp (3872)
- D:Esoph (4116)
- D:Stomduo (4138) (4154)
- D:L.Intest (4264) (4267) (4268) (4280)
- D:Livbil:Gallb (4534)
- D:Gen (4634)
- D:Gen:Parasit (4667)

Stomach

3903 EFFECT OF SECRETIN AND JEJUNAL ACIDIFICATION ON GASTRIC AND PANCREATIC SECRETION IN MAN.

(E.) Konturek, S. J. (Med. Acad., Cracow, Poland). *Gut* 11(2):158-162, 1970.

The inhibitory effect of i.v. secretin and intrajejunal acid infusion on basal and pentagastrin-induced gastric acid secretion as well as the stimulatory influence of both infusions on pancreatic flow rate and bicarbonate output were compared in healthy subjects. Secretin (2 U/kg/hr i.v.) produced an inhibition (60%) of basal acid output and a decrease (30%) in pentagastrin-induced gastric secretion. Intrajejunal acid infusion did not affect the gastric secretion but resulted in an increase in pancreatic volume flow and bicarbonate output reaching about 40% of the pancreatic response to secretin (2 U/kg/hr i.v.). Secretin seemingly is a strong inhibitor of spontaneous gastric acid secretion and acid in the jejunum apparently causes the release of secretin in man.

3904 THE EFFECT OF CORTICOTROPIN AND CORTISONE ON THE CONTENT OF FUCOSE IN STOMACH MUCOSA OF WHITE RATS.

(E.) Koslowska, K. (Med. Sch., Gdansk, Poland) and B. Zurawska-Czupa. *Endokrinologie* 55(5-6):349-352, 1970.

Fucose content of the mucous membrane of fundic and pyloric stomach was determined in male Wistar rats given ACTH or cortisone in similar doses of 25 mg, 5 times every 2 hr. Fucose content was higher in the pyloric than in the fundic stomach (794.5 mg/100 g vs. 265.4 mg/100 g). ACTH and cortisone both increased the fucose content in both regions of the stomach with ACTH having a slightly greater effect than cortisone. After ACTH administration, fucose content of the fundic and pyloric stomach was 346.3 and 955.0 mg/100 g, resp., and after cortisone administration, 325.7 and 948.0 mg/100 g, resp.

3905 USE OF SYNTHETIC MEMBRANE MODELS IN THE STUDY OF GASTRIC SECRETORY PROCESSES.

(E.) Berkowitz, J. M. (Meadowbrook Hosp., East Meadow, N. Y.) and M. Praissman. *Adv_Exp Med Biol* 7:309-321, 1970.

Ion and water flow across resting gastric mucosa was studied in dogs. Using canine fundic pouches and sulfonic acid membranes, the exchange of hydrogen for sodium across the fixed negative charges of the gastric mucous coat yielded an anomalous osmotic flow of solvent. Although many of the carboxyl groups at the luminal surface were ionized when the coat was bathed with acid, the pH at the cellular level approached 7 and the the carboxyl groups located there were ionized. The bi-ionic exchange across the asymmetrically distributed anionic groups produced a secondary flow of solvent which transformed the primary acid secretory product into a sodium-rich hypotonic fluid. Experiments with antral pouches and the methacrylic acid membrane showed that the natural stimulants of gastrin release, such as glycine, could pass through the ionized, hydrated mucous gel that lay on the surface of the antrum. On permeating the gel, these compounds diffused into the gland and penetrated the gastrin containing cells. The release of gastrin caused the fundic mucosa to secrete acid which di fused over the surface of the antrum leading to t protonation of the carboxyl containing groups in glycoproteins. With the loss of the negative cha ges, membrane hydration declined and the permeabi ty to cations was altered. These changes were pr ably the basis of the servo-mechanism by which ac secretion diminished the release of its primary h monal stimulant gastrin.

3906 PRODUCTION OF GASTRIC HYPERSECRETION IN THE RAT.

(E.) Vogel, T. T. (Ohio St. U Coll. Med., Columbus), J. A. Jackson and G. Endah *J Appl Physiol* 28(4):505-506, 1970.

Subtotal transplantation of the antrum to the tra verse colon in male Holtzman rats resulted over a 2-hr collection period in an average of 2.7 ml of fluid containing 0.25 mEq of acid (41 determinati on 8 animals) compared with 1.5 ml of fluid conta ing 0.07 mEq of acid (26 determinations on 11 animals) in rats with gastric cannula inserted witho transplantation. This is almost twice that origi ally reported in dogs over 24 hr. I.v. infusion 0.5 mg stage I gastrin, using antral transplant a mals, doubled the acid secretion in 13 trials usi 1-hr collection periods (some tendency for basal secretion to increase with aging of the animals w noted). Economy, availability, relative ease in preparation, and difference in species seemingly makes this preparation a reasonable alternative t the dog for the study of gastric hypersecretory states in the study of gastric physiology and the pharmacologic effects of drugs.

3907 MAXIMAL ACID RESPONSE OF PAVLOV POUCHES TO FOOD AND HISTAMINE.

(E.) Brooks, A. (VA Ctr., U. California Los Angeles Sch. Med.) an M. I. Grossman. *Gut* 11(2):153-157, 1970.

The secretion of gastric acid in response to hist mine, insulin and a meal of liver (with and witho 5% bone dust) was studied in 3 dogs (12.7-16.2 kg) with Pavlov pouches and gastric fistulas. In feeding experiments, the gastric fistula was clos and i.v. administration of 154 mM NaCl was delive (60 ml/hr) throughout the experiment. Histamine infusions at 0.08, 0.16, and 0.32 mg/kg/hr produc a sustained acid output from the Pavlov pouch that rose from a resting value of less than 0.5 mEq/15 min to a peak of 3 mEq/15 min within 1.5 hrs. Th was no significant difference between the three doses in the peak 15-min acid output. The ratios insulin-induced to histamine-induced secretion we the same in pouch and in the main stomach, indica that their innervation was equivalent. Meals of liver and bone dust mixture in amounts of 11 to 4 g/kg resulted in Pavlov pouch acid outputs that were 34% to 56% higher than the maximum response histamine. Liver meal without bone dust produced acid outputs that were 29.5% to 41.4% higher than the peak histamine output. Combinations of endogenously generated stimuli seemingly can produce potentiated gastric response which exceeds that produced by histamine alone.

08 UNDISSOCIATED ACIDITY OF HUMAN GASTRIC
JUICE: MEASUREMENT AND RELATIONSHIP TO
OTEIN BUFFERS. *(E.)* Makhlouf, G. M. (U. Alabama
d. Ctr., Birmingham), A. L. Blum and E. W. Moore.
stroenterology 58(3):345-351, 1970.

s part of a study on the pepsin response of one
kg male subject to continuous i.v. infusion of
arying doses of gastrin II or histamine acid phos-
ate, data was obtained concerning the undissociated
idity of gastric juice in an attempt to determine
e end point of the titratable acidity (as measured
the glass electrode) and the nature of the pro-
ins of protein fragments that could act as buffers
the gastric juice. An estimate of titratable
idity was obtained by extending the titration to
at end point at which the positive charges con-
ributed by Na^+, K^+, H^+ ions and buffered protons
atched the negative charges contributed by Cl^-.
ere was a highly significant correlation between
$^+$ ion concentration and titratable acidity to any
iven pH. Equations based on this correlation showed
at there was a discrepancy between titratably
cidity and H^+ ion concentration which increased as
he concentration of the acid decreased. There was
lso a significant correlation between titratable
cidities to any two given pH values. The correlation
eld at all concentration levels and for basal,
istamine, and gastrin data. In 38 of 41 gastric
amples, the value for the cations calculated from
he sum of the Na^+, K^+, and H^+ ions was less than the
orresponding Cl^- concentration (the discrepancy
idening with decreasing acid concentration). The
um of Na^+, K^+, and titratable acidity to pH 7.0 was
lso lower than the Cl^- concentration in 80% of the
amples, while at pH 9.4 it was higher than the Cl^-
oncentration in 90% of the samples (the best corre-
ation at all levels and for the average of the com-
ined data was obtained for titratable acidity to
H 8.3). There was an increasing difference between
he titratable acidities to pH 8.3 and pH 7.0 with
ncreasing total protein concentration which was re-
ated to the nonprotein pepsin fraction, since the
ifference in titration was unrelated to the pepsin
oncentration.

909 INFLUENCE OF ADRENOCORTICOTROPIN, CORTI-
SONE, ASPIRIN AND PHENYLBUTAZONE ON THE
ATE OF EXFOLIATION AND THE RATE OF RENEWAL OF GAS-
RIC MUCOSAL CELLS. *(E.)* Menguy, R. (Dept. Surg.,
. Chicago, Ill.) and M. Max. *Gastroenterology*
8(3):329-336, 1970.

he influence of cortisone, ACTH, aspirin, and phenyl-
utazone on the rate of exfoliation of surface epi-
helial cells of the canine gastric mucosa into the
tomach lumen was evaluated by measuring the concen-
ration of DNA in Heidenhain pouch washings before,
uring and after the administration of the drugs. The
itotic frequency in gastric mucosal biopsies was
etermined before and during the administration of
CTH and aspirin and the influence of aspirin on the
ate of uptake of thymidine-^3H by the gastric mucosa
f rats was evaluated by radioautography. The rate
f exfoliation of surface epithelial cells was re-
uced by ACTH and cortisone and was increased by
spirin and phenylbutazone. Whereas ACTH decreased the mitotic frequency in gastric mucosal biopsies, aspirin had no significant effect and did not affect the rate of uptake of thymidine-^3H by gastric mucosa of rats. One of the mechanisms of gastric mucosal injury by ACTH and cortisone may be a reduced rate of renewal of surface epithelial cells. Aspirin and phenylbutazone appeared to affect the gastric mucosa in such a way that shedding of surface cells increased without a concomitant increase in the rate of cell removal.

3910 GASTRIC HYPOSECRETION PRODUCED IN RATS BY LONG-TERM ORAL ADMINISTRATION OF GLYCOPYRROLATE. *(E.)* Kowaleswki, K. (Surg. Med. Res. Inst., U. Alberta, Edmonton, Canada) and J. Schier. *Canad J Physiol Pharmacol* 48(3):157-159, 1970.

3911 LIPIDS OF THE GASTRIC JUICE IN NORMAL AND PATHOLOGICAL CONDITIONS. *(It.)* Gandolfi, L. (Inst. Clin. Med. Gen. Med. Ther., U. Bologna, Italy), C. Calabrese, L. Frizziero and O. Masiello. *Arch Pat Clin Med* 45(6):484-490, 1969.

3912 STOMACH TRANSPLANT. *(It.)* Grassi, G. (United Hosp. Rome, Italy), S. B. Valentini. *Chir Gastroent* 3(4):411-417, 1969.

3913 FORMATION AND STORAGE OF AMINES IN ENDOCRINE CELLS OF GASTRIC MUCOSA. *(E.)* Aures, D. (VA Hosp., Sepulveda, Calif.), R. Hakanson and C. Owman. *J Neurovisc Relation* 31(4):337-349, 1970.

3914 DIRECT INHIBITORY EFFECT OF ADENOSINE MONOPHOSPHATES ON Na^+-K^+-DEPENDENT ATPASE PREPARED FROM HUMAN GASTRIC MUCOSA. *(E.)* Mozsik, G. (U. Med. Sch., Pecs, Hungary). *Europ J Pharmacol* 9(2):207-210, 1970.

3915 A NEW STIMULANT OF GASTRIC SECRETION: PENTAGASTRIN. *(Por.)* Neto, C. A. DaS. (Fac. Med. U. San Paulo, Brazil) and H. W. Pinotti. *Rev Goiana Med* 15(1-2):21-29, 1969.

3916 EFFECT OF VITAMIN B_6 UPON GASTRECTOMY-INDUCED CENTRAL NERVOUS SYSTEM DEGENERATIONS. III. *(E.)* Petri, S. (Oresunds Hosp., Copenhagen, Denmark) and C. Petri. *Acta Med Scand* 187(1-2):129-131, 1970.

3917 THE ACTION OF 2-DEOXY-D-GLUCOSE UPON GASTRIC SECRETION. STUDIES ON THE PYLORUS LIGATED RAT. *(Ger.)* Welsch, K. H. (Surg. U. Polyclin. Munich, Germany), J. Klempa, D. Balser and W. Hart. *Z Gastroent* 7(6):457-463, 1969.

3918 CHANGES IN HUMAN GASTRIC ACID AND ELECTROLYTE SECRETION FOLLOWING THE ADMINISTRATION OF A GASTRIN-LIKE PENTAPEPTIDE. *(It.)* Antonelli, A. (Dept. Gen. Clin. Med. Med. Ther., U. Siena, Italy), P. L. Zampetti, P. F. Bayeli and M. Montagnani. *Minerva Gastroent* 16(1):1-8, 1970.

3919 NOCTURNAL RHYTHM OF GASTRIC SECRETION IN THE RAT WITH PYLORUS LIGATION. *(Fr.)* Dubrasquet, M. (Hosp. Bichat, Paris, France), M. Lewin, P. Bernades and S. Bonfils. *C R Soc Biol* 163(6): 1279-1282, 1969.

3920 ^{99m}Tc AND I^{131} IN THE STOMACH. *(Ger.)* Fridrich, R. (Commun. Hosp. Basel, Switzerland), W. Meier-Ruge and G. Englehart. *K Wschr* 48(3):174-179, 1970.

- P:Morph (3793) (3795) (3822) (3860)
- P:Motil (3889) (3890) (3893)
- Diagproc (4076)
- D:Stomduo (4136) (4142) (4148) (4149) (4152) (4160) (4161) (4168) (4170) (4177) (4179) (4180) (4181)
- D:Stomduo:Peptulc (4183) (4184) (4187) (4189 (4206) (4212) (4215)

SECRETION AND METABOLISM

Pancreas

3921 SECRETIN. *(Ger.)* Sewing, K. Fr. (Pharmacol. Inst. U. Tubingen, Germany). *Z Gastroent* 7(6):450-456, 1969.

3922 CANCER DEVELOPMENT IN AN EXPERIMENTAL PANCREAS AUTOTRANSPLANT. *(Fr.)* Murat, J. E. (I.N.S.E.R.M. Lyon, France), F. T. Moore and H. J. Verine. *J Chir* 98(6):681-684, 1969.

3923 EXPERIMENTAL AUXILIARY PANCREAS TRANSPLANTATION: BIOCHEMICAL STUDY OF ITS REJECTION. *(Por.)* Pinotti, H. W. (Fac. Med. U. San Paulo, Brazil), G. Ellenbogen, A. Raria, W. Lins, S. Fera, W. Garbin, W. Louza and E. J. Zerbini. *Rev Hosp Clin Fac Med San Paulo* 24(6):343-348, 1969.

3924 BLOOD SUGAR, SODIUM BICARBONATE AND EXTERNAL PANCREATIC SECRETION MODIFIERS IN THE RAT. *(Fr.)* Debray, C. (Hosp. Bichat, Paris, France), J. De La Tour, C. Vaille, C. Roze, M. Souchard. *Presse Therm Climat* 106(4):233-236, 1969.

3925 MAXIMAL BICARBONATE SECRETION OF THE HUMAN PANCREAS. *(Fr.)* Vagne, M. (Hosp. Eduoard Herriott, Lyon, France), L. Descos and P. Martin. *C R Soc Biol* 163(6):1403-1406, 1969.

3926 THE PANCREAS TRANSPLANT. *(It.)* Sodaro, A. A. (Inst. Clin. Surg. Gen., U. Rome, Italy), C. Colella, G. Galassi, F. Corneli, A. T M. Sottosanti and E. Tamburrino. *Progresso Med* 25(17):613-620, 1969.

3927 EXPERIMENTAL PANCREAS TRANSPLANT: PRELI NARY RESULTS. *(It.)* Sodaro, A. A. (Ins Clin. Surg. Gen. Surg. Ther., U. Rome, Italy) C. Colella, A. Thau, F. Corneli, G. Galassi, M. Sottosanti and M. Pochini. *Progresso Med* 25(20): 722-727, 1969.

3928 PANCREAS TRANSPLANT. *(It.)* Sodaro, A. (Inst. Clin. Surg. Gen. Surg. Ther., U. Rome, Italy), C. Colella, G. Galassi, A. Thau, F. Corneli, M. Sottosanti and M. Toso. *Progresso Me* 25(21):767-770, 1969.

- P:Morph (3843) (3854)
- P:Absorp (3864)
- P:Secr:Stom (3903)
- Diagproc (4064) (4066)
- D:Pancreas (4338) (4343)
- D:Pancreas:Pancreat (4350)

Hepatobiliary Tract

29 EFFECT OF DRUG ADMINISTRATION ON THE ACTIV-
ITY OF THE HEPATIC MICROSOMAL ETHANOL
DIZING SYSTEM. *(E.)* Lieber, C. S. (Bronx VA
p., New York) and L. M. DeCarli. *Life Sci* 9(5):
-276, 1970.

effects of drug administration on the activity
hepatic microsomal ethanol oxidizing system were
idied in male Sprague-Dawley rats. Hepatic micro-
al protein content was increased by the adminis-
ation of butylated hydroxytoluene (0.84 g/kg/day
.), by phenobarbital (80 mg/kg/day i.p. for 4
s) and by 3-methylcholanthrene (20 mg/kg i.p.).
er weight was increased 10 to 15% by phenobarbital
30 to 40% by 3-methylcholanthrene and butylated
roxytoluene. Hepatic microsomal protein content
liver weight (by 10 to 15%) were increased in
e rats but not in female rats after ethanol in-
tion for 24 days. The hepatic microsomal ethanol
dizing system activity was increased by pheno-
bital, ethanol, 3-methylcholanthrene and butylated
roxytoluene when the oxidizing system activity was
lated to body weight but not when the activity was
lated to microsomal protein. The increase in hepa-
microsomal ethanol oxidizing system activity was
associated with an increase in the activities of
atic alcohol dehydrogenase or catalase. Almost
nplete inhibition of catalase activity by 3-amino-
,4-triazole was accompanied by a lesser reduction
hepatic microsomal ethanol oxidizing system activ-
. The increase in hepatic microsomal ethanol
dizing system activity produced by ethanol was not
ibited by 3-amino-1,2,4-triazole.

30 MECHANISMS OF FATTY ACID SYNTHESIS IN
RAT-LIVER MICROSOMES. *(E.)* Landriscina,
(Dept. Biochem., U. Bari, Italy), G. V. Gnoni
d E. Quagliariello. *Biochim Biophys Acta* 202(3):
5-414, 1970.

e incorporation of (1,3-$^{14}C_2$)malonyl-CoA into
tty acids by Wistar rat-liver microsomes was sub-
antial (more than 60% maximal synthetic activity)
the absence of ATP. The ratio of total radioac-
vity to radioactivity in the carboxyl carbon of
e fatty acids synthesized in these conditions was
tween 7.6:1 and 7.8:1. In the presence of ATP
aximal stimulation at 1 mM) the incorporation was
creased and in these conditions the ratio was
wered from 7.9:1 to 3.5:1 and by increasing the
P concentration this ratio was further decreased.
lmityl-CoA inhibited fatty acid synthesis *de novo*
ile promoting chain elongation. Arsenite and
ethylmaleimide completely inhibited synthesis *de*
vo and chain elongation (at 8 to 10 times higher
ncentration than for synthesis *de novo* inhibition).
oth inhibitions are prevented by β-mercaptoetha-
l). In the absence of ATP palmitate was the pre-
minant fatty acid synthesized while in the presence
ATP stearate, oleate and longer chain fatty acids
re synthesized. In rat-liver microsomes two mech-
isms of fatty acid synthesis seemingly are present:
) chain elongation, and (b) synthesis *de novo*,
erative maximally in the absence of ATP. Chain
ongation starts to function in the presence of ATP
d becomes the major synthetic pathway when the ATP
ncentration is increased.

3931 GLUCONEOGENESIS FROM PROPIONATE IN KIDNEY AND LIVER OF THE VITAMIN B$_{12}$-DEFICIENT RAT. *(E.)* Weidemann, M. J. (Inst. Physiol. Chem., U. Munich, Germany), R. Hems, D. L. Williams, G. H. Spray and H. A. Krebs. *Biochem J* 117(1):177-181, 1970.

Kidney cortex slices and the perfused livers of vitamin B$_{12}$-deficient rats removed proprionate from the incubation and perfusion media at 33 and 17%, resp., of the rates found with tissues from rats receiving either a normal or vitamin B$_{12}$-supplemented diet. There was a corresponding fall in the rates of glucose synthesis from proprionate in both tissues and the addition of hydroxocobalamin or dimethylbenzimidazolylcobamide coenzyme to kidney cortex slices from vitamin B$_{12}$-deficient rats *in vitro* failed to restore the normal capacity for propionate metabolism. Although the vitamin B$_{12}$-deficient rat excreted measureable amounts of methylmalonate, no methylmalonate production could be detected when kidney cortex slices or livers from vitamin B$_{12}$-deficient rats were incubated or perfused with proprionate. The addition of methylmalonate (5 mM) to kidney cortex slices from rats fed on a normal diet inhibited gluconeogenesis from proprionate by 25%. Methylmalonate formation is normally only a small fraction of the flux through methylmalonate-CoA but this fraction increased in vitamin B$_{12}$-deficient tissues (presumably because the concentration of methylmalonyl-CoA rises as a result of low activity of methylmalonyl-CoA mutase).

3932 PERFUSION OF RAT'S LIVER WITH BLOOD: TRANSMITTER OVERFLOWS AND GLUCONEOGENESIS. *(E.)* Powis, G. (Dept. Biochem. U. Oxford, England). *Proc Roy Soc London* 174:503-515, 1970.

When the isolated rat or guinea pig liver is perfused with blood by a method which avoids any interruption in blood supply, the liver remains almost normal for up to 4 hr. Perfusion with oxygenated blood through both the hepatic artery and portal vein confers no special advantages (as judged by lactate utilization) over perfusion through the portal vein alone. No overflows of sympathetic transmitter could be detected from the perfused liver of the rat after nerve stimulation unless catechol-O-methyl transferase inhibitors were present; even in the presence of phenoxybenzamine (to block transmitter uptake by nerve endings) overflows were small. Larger noradrenaline overflows were obtained on hepatic nerve stimulation of the perfused guinea-pig liver, perhaps related to the much larger total noradrenaline content. Nerve stimulation caused a transient increase in the rate of gluconeogenesis by the rat liver, with the maximum response, an increase of 60%, occurring after 5 min stimulation at a frequency of 10 Hz (maximum vascular response within 2 min).

3933 EUFLAVIN AND ETHIDIUM BROMIDE: INHIBITORS OF MITOCHONDRIOGENESIS IN REGENERATING RAT LIVER. *(E.)* De Vries, H. (Lab. Physiol. Chem., U. Groningen, Netherlands) and A. M. Kroon. *FEBS Letters* 7(4):347-350, 1970.

The intercalating trypanocidal dyes, euflavin and ethidium bromide, were injected i.p. or i.v. at 5 or 10 μg/kg into male Wistar rats at the time of partial hepatectomy, and homogenates were prepared from the regenerating livers excised 46 hr later. The protein content of livers from treated animals did not differ significantly from control values, showing that regeneration was not influenced by the dyes. Cytochrome *c* oxidase formation in mitochondria from regenerating rat liver was markedly inhibited by both dyes (especially by ethidium bromide injected i.p.). In the mitochondria of euflavin- or ethidium bromide-treated rats the concentration of cytochrome aa_3 (the hemoprotein identical to cytochrome *c* oxidase) is low compared to the extramitochondrially synthesized cytochrome *c*. The formation of cytochrome *c* oxidase *in vivo* seemingly depends not only on the mitochondrial translation system but also on the mitochondrial genome.

3934 LIVER PHOSPHOLIPID METABOLISM: EFFECT OF DIFFERENT LEVELS OF DIETARY GROUNDNUT PROTEIN. *(E.)* Eapen, S. (Vallabhbhai Patel Chest Inst., U. Delhi, India), S. L. Katyal and T. Venkitasubramanian. *Indian J Biochem* 6(4):194-198, 1969.

The effects of feeding different levels of dietary groundnut protein (supplying 5% (group I), 10% (group II), 20% (group III) and 35% (group IV) of the total caloric intake) on phospholipid metabolism in the liver were studied in rats. In groups I and II, total lipids were significantly increased (63.97 and 54.77 mg/g wet liver, resp.) while phospholipid content was decreased (20.81 and 24.46 mg/g wet liver, resp.). In a study of the incorporation of ^{32}P-labeled methionine-($^{14}CH_3$) and formate-1-^{14}C into various phospholipids, it was found that the extent of incorporation of ^{32}P into phospholipids was maximum in group I with 4.29% of the total label recovered. The lowest labeling of total lipids and phosphatidyl choline of tissue slices from methionine-(methyl-^{14}C) was observed in group I and that from formate-^{14}C was highest in this group. Some separate mechanism of methylation of phosphatidyl ethanolamine to phosphatidyl choline involving formate seemingly may exist, however this needs further exploration.

3935 BENZPYRENE HYDROXYLASE ACTIVITY AND ITS INDUCTION BY METHYLCHOLANTHRENE IN MORRIS HEPATOMAS, IN HOST LIVERS, IN ADULT LIVERS AND IN RAT LIVER DURING DEVELOPMENT. *(E.)* Watanabe, M. (Res. Inst. Tuberculosis, Leprosy, Cancer, Tohoku U., Sendai, Japan), V. R. Potter and H. P. Morris. *Cancer Res* 30(2):263-273, 1970.

Under controlled feeding conditions, male and female Buffalo rats were used to study benzpyrene hydroxylase activity and its induction by a single injection of methylcholanthrene (2 mg/100 g body weight) during developmental stages and in Morris Hepatomas 9618A, 9633, 7800, 7794A, and 8999. Benzpyrene hydroxylase activity in Hepatoma 9633 was very low, but after administration of methylcholanthrene the activity was markedly increased, with some modification by variations in the time of injection. The benzpyrene hydroxylase activities in the host livers were strongly influenced
by the size of the pooled hepatoma in rats bearing
Hepatoma 8999 but not in rats bearing Hepatoma
9618A, while in the latter an influence of feeding
regimen was shown. Methylcholanthrene was able t
induce benzpyrene hydroxylase activity in Morris
hepatomas as well as in the corresponding host
liver, although the induced levels in hepatomas
were always lower than those in the host liver.

3936 BILE SECRETION IN ISOLATED HAMSTER LIVER
(E.) King, J. E. (Mayo Clin., Rochester
Minn.), S. Oshiba, and L. J. Schoenfield. *J Appl*
Physiol 28(4):495-500, 1970.

A model for the study of isolated perfused hamster
liver was established because bile acids in hamste
bile are the same as in human bile and bile acid
secretion is believed to be the initiating event i
bile formation. Mean bile flow was 0.047 ml/hr pe
g wet liver weight, and taurocholate infusion (1.7
micromoles/hr) prevented the decrease in concentra
tions of both bile acids and bilirubin that occurr
during basal perfusion. The intestinal origin of
deoxycholic acid and the hepatic origin of cholic
and chenodeoxycholic acids were substantiated. Th
cumulative recovery from the bile of unconjugated
sulfobromophthalein (BSP) 4 hr after bolus injecti
of a dose of 0.5 mg/100 g body weight to the perfusate was about 61.7%; 61.9% of BSP in bile was
conjugated, and about 30% of the injected BSP prob
ably was in liver storage compartments or the duct
system. Single injections of taurocholate (24 micromoles/100 g body weight) and secretin (0.4 cli
cal unit/100 g body weight) induced chloresis, co
parable to that observed in hamsters with bile fis
tulas which showed greater bile flow and bilirubi
concentration. The BSP recovery in bile did not
differ appreciably between hamsters with bile fis
las and the isolated liver preparation, but the ma
mal percentage of conjugated BSP was less in hams
with fistulas. Restoration of the taurocholate en
terohepatic circulation significantly influenced
acid and bilirubin excretion in this model.

3937 LIPID COMPOSITION OF SUBCELLULAR FRACTI
IN CARBON TETRACHLORIDE INDUCED FATTY
LIVER. *(E.)* Koppikar, S. V. (Bhabha Atomic Res.
Ctr., Bombay, India), J. G. Satav, P. Fatterpaker
and A. Sreenivasan. *Indian J Biochem* 6(4):185-18
1969.

Carbon tetrachloride administration (a single dose
of 0.2 ml per 100 g body weight) to rats resulted
a significant decrease in liver microsomal lipids,
cholesterol and total phospholipids, at 3 and 24
after ingestion while only marginal alterations w
observed in the lipid content of the mitochondrial
fraction, and these were evident only at a later
stage when general cellular damage had considerabl
advanced. It appears that the decrease in lipid
tent of microsomes probably makes them heavier, w
the result that they tend to co-sediment with mit
chondrial fractions. The limited changes in the
lipid content of the mitochondrial fraction could

ıanifestation of repair mechanism operative in
ıse organelles, since, at the doses administered,
ı animals do not die, but recover after 48 hr. Al-
ːed lipid content of subcellular fractions did not
ult in an appreciable change in the phospholipid
stribution pattern except for a generalized in-
ased presence of lysophosphatides in the micro-
ıal, mitochondrial and cell sap fractions.

38 STUDIES ON THE CONTROL OF FATTY ACID OXIDATION IN LIVER PREPARATIONS FROM CHICK

3RYOS. *(E.)* Koerker, D. J. (Dept. Physiol., U.
:higan, Ann Arbor) and I. B. Fritz. *Canad J*
ochem 48(4):418-424, 1970.

ı characteristics and developmental pattern of the
abolic pathway for fatty acid oxidation were in-
stigated in liver slices and mitochondria prepared
ɔm chick embryos of varying ages. The incorpora-
ɔn of labeled palmitate into CO_2 was increased
ɔfold by carnitine in liver slices of 8-day-old
ick embryos and by nearly 6- to 10-fold in tissues
epared from 10- or 12-day-old embryos. A similar
crease was seen in the degree of augmentation of
togenesis induced by carnitine in liver slices
epared from the 10-day-old embryo, suggesting an
creased carnitine palmitoyltransferase activity
liver cells during the 8th to the 10th day of de-
lopment. Palmitoyl-CoA was not metabolized in the
sence of carnitine, whereas the palmitoyl portion
palmitoylcarnitine readily supported respiration
embryonic chick liver mitochondria. Mitochondrial
eparation showed good respiratory control and
P/0 ratios of 2.6 to 3.3 with several substrates
lutamate α-ketoglutarate, acylcarnitine, malate)
d albumin was necessary for maximum control. The
ministration of glucose to chick eggs which had
eviously been incubated for approximately 4.5 days
sulted in changes in the metabolism (exemplified
decrease in the conversion of labeled palmitate
β-hydroxybutyrate) of embryos killed 5 days later,
ich indicated that tissues of the chick embryo
re capable of integrative metabolic adaptations in
sponse to changes in substrate supply.

39 PHOSPHOPROTEINS OF PLASMA MEMBRANES FROM RAT-LIVER CELLS: PHOSPHORYLATION BY

-^{32}P]ATP. *(Fr.)* Blat, C. (Inst. Sci. Res. Cancer,
llejuif, France) and L. Harel. *Biochim Biophys*
ta 203(2):271-282, 1970.

ıdies were made of 3 different phosphorylated
ɔups in phosphoproteins of plasma membranes from
t liver cells. The three groups (alkali-unstable
ɔsphoserine and phosphothreonine, acid-unstable
osphohistidine, and acylphosphate group unstable
hydroxylamine) were phosphorylated when the mem-
anes were incubated with (γ-^{32}P)ATP during 30 sec.
e degree of phosphorylation depended on conditions
incubation: 90% of the incorporated radioactivity
s in acylphosphate phosphoproteins when the mem-
anes were incubated at 0° C with a low concentra-
on of Mg^{2+}. When the membranes were incubated at
° C with Mg^{2+} (5mM) only 43% of the incorporated
dioactivity was hydroxylamine-unstable, 41% was
id unstable and 16% alkali unstable. The turnover of phosphate of the acylphosphate group was faster than that of phosphate of phosphohistidine while the phosphate of phosphoserine and phosphothreonine appeared to be relatively stable. Phosphorylation of acylphosphate and phosphohistidine phosphoproteins was especially Na^+-, K^+-dependent and was inhibited by ouabain as was (Na^+-K^+)-dependent ATPase of the membranes.

3940 ORNITHINE DECARBOXYLASE ACTIVITY IN RELATION TO GROWTH OF RAT LIVER: EFFECTS OF PARTIAL HEPATECTOMY, HYPERTONIC INFUSIONS, CELITE INJECTION, OR OTHER STRESSFUL PROCEDURES.

(E.) Schrock, T. R. (U. California Sch. Med., San Francisco), N. J. Oakman and N. L. R. Bucher. *Biochim Biophys Acta* 204(2):564-577, 1970.

Female Charles River rats undergoing partial hepatectomy (9, 34, 68 or 77% of the total liver) and paired for cross circulation via the carotid arteries and jugular veins were used to study the specificity of association between ornithine decarboxylase activity and growth of rat liver as indicated by incorporation of labeled thymidine into DNA. The level of hepatic ornithine decarboxylase activity in normal rats fed *ad libitum* or denied food for 12 hr was 0.4 nmole $^{14}CO_2$/g liver per 30 min incubation. Major elevations of the enzyme (25 to 70 times normal) were produced by partial hepatectomies ranging from 9 to 77%, cross circulation of a normal with a 77%-hepatectomized rat, large infusions of hypertonic glucose or mannitol, or i.p. injection of Celite. Minor elevations (2 to 9 times normal) resulted from fasting and refeeding, fasting and sham hepatectomy, cross circulation of normal-to-normal or normal-to-Celite-injected partners, smaller hypertonic infusions, injection of albumin, epinephrine, norepinephrine, or confinement in restraining cages. While enhanced ornithine decarboxylase activity was an early feature of liver growth in these experiments, stimuli not inducing growth also induced the enzyme to increase, and the extent of increased enzyme activity was not necessarily proportional to the rate of growth when it did occur. Although putrescine formation seems not to be directly linked to DNA replication, it may be involved with some earlier step in the growth process, perhaps enhancement of RNA synthesis or function.

3941 METABOLIC ADAPTATIONS IN RAT HEPATOMAS: ALTERED REGULATION OF SERINE DEHYDRATASE SYNTHESIS BY GLUCOSE AND AMINO ACIDS IN HEPATOCELLULAR CARCINOMAS.

(E.) Jost, J. P. (Nat. Jewish Hosp., Denver, Colo.) and H. C. Pitot. *Cancer Res* 30(2):387-392, 1970.

The effect of forced feeding of amino acid mixtures on the glucose-induced repression of serine dehydratase was studied in rats with highly differentiated hepatocellular carcinomas (Morris 5123 and 7800 hepatomas and Reuber H-35 hepatomas). The forced feeding of amino acid mixtures had no effect on changing the high levels of serum dehydratase present in Morris 5123 hepatoma. Serine dehydratase levels rose from 1800 ± 280 μmoles product/hr/gm before amino acid feeding, to a high level of 2460 ±

650 µmole product/hr/gm after 18 hr of amino acid feeding. The amino acid feeding regimen increased serine dehydratase levels in Morris 7800 hepatomas from an initial value of 190 ± 20 µmoles product/hr/gm to a high value of 382 ± 60 µmoles product/hr/gm; and in Reuber H-35 hepatomas from an initial value of 215 ± 100 µmoles product/hr/gm to 620 ± 60 µmoles product/hr/gm after 18 hr of amino acid feeding. Glucose administration together with the amino acid feeding had no effect in changing or inhibiting the stimulated levels of the amino acids in the hepatomas. The rate of synthesis of serine dehydratase in Morris 5123 hepatoma was demonstrated, by quantitative precipitin techniques and by pulse labeling with valine ^{14}C, to be extremely high (3,200 ± 300 units/gm) compared with normal liver (66.0 ± 23 units/gm), and the administration of amino acids or glucose had no effect on valine incorporation into serine dehydratase. A deranged effect of glucose on enzyme synthesis seemingly exists and is probably the result of altered mechanisms of the translational control of enzyme synthesis.

3942 EFFECTS OF ISCHEMIA ON METABOLITE CONCENTRATIONS IN RAT LIVER. *(E.)* Brosnan, J. T. (Charles H. Best Inst., U. Toronto, Ontario, Canada), H. A. Krebs and D. H. Williamson. *Biochem J* 117(1):91-96, 1970.

Changes in the concentrations of ammonia, glutamine, glutamate, 2-oxoglutarate, 3-hydroxybutyrate, acetoacetate, alanine, aspartate, malate, lactate, pyruvate, NAD^+, NADH and adenine nucleotides were measured in freeze-clamped rat livers during ischemia. Although the concentrations of most of the metabolites changed during ischemia, the ratios (glutamate)/(2-oxoglutarate)(NH_4^+) and (3-hydroxybutarate)/(acetoacetate) changed equally and the value of the expression (3-hydroxybutarate) (1-oxoglutarate) (NH_4^+)/(acetoacetate) (glutamate) remained approximately constant. The value of the expression (alanine) (oxoglutarate)/(pyruvate)(glutamate) was about 0.7 *in vivo* and remained fairly constant during the ischemic period of 5 min, although the alanine and oxoglutarate concentrations changed substantially. Injection of L-cycloserine 60 min before the rats were killed increased the alanine concentration in the liver fourfold and decreased the concentrations of the other metabolites measured, except that of pyruvate. During ischemia the concentration of alanine did not change but that of the aspartate almost doubled. The *in vivo* value of (alanine)(oxoglutarate)/(pyruvate)(glutamate) rose from 0.7 to 2.4 and during ischemia the value returned to 0.8. The rate of anerobic glycolysis calculated from the increase in the lactate concentration was 1.4 µmol/min/g fresh weight. Although the concentrations of the adenine nucleotides changed rapidly during ischemia, the ratio (ATP)(AMP)/$(ADP)^2$ remained constant at 0.54, indicating that adenylate kinase established near-equilibrium under these conditions.

3943 GEL ELECTROPHORESIS PATTERNS OF THE PROTEINS OF ORGANELLES ISOLATED FROM BOVINE LIVER. *(E.)* Zahler, W. L. (Dept. Molec. Biol., Vanderbilt U., Nashville, Tenn.), B. Fleischer and S. Fleischer. *Biochim Biophys Acta* 203(2):283-2
1970.

The protein components of mitochondria, nuclei,
rough and smooth microsomes, plasma membranes an
a Golgi fraction isolated from bovine liver by p
acrylamide gel electrophoresis were characterize
thoroughly both enzymatically and by electron mi-
croscopy. The mobilities of the major protein b
relative to ribonuclease A were determined and c
parisons made among the organelles. The major
protein components of rough and smooth microsome
were indistinguishable. Golgi vesicles were sim
to, but easily distinguishable from, endoplasmic
reticulum (as represented by the rough microsome
fraction). A major band in the Golgi preparatio
had the same mobility as the major protein compo
found in serum β-lipoproteins. Mitochondria, pl
membranes and nuclei had electrophoretic pattern
which were characteristic of each cell fraction
were distinct from each other and from microsome
Golgi preparations. The patterns of whole nucle
were similar in mobility to ribonuclease. All t
organelles except plasma membranes had a major p
tein component with mobility identical to that f
for purified structural protein isolated from mi
chondria.

3944 DEGRADATION OF STEROIDS BY INTESTINAL
BACTERIA: I. DECONJUGATION OF BILE S
(E.) Aries, V. (St. Mary's Hosp. Med Sch., Lond
England) and M. J. Hill. *Biochim Biophys Acta*
202(3):526-534, 1970.

Whole cells and wall-membrane fractions from 2 h
fecal strains of each of the genera Enterococcus,
Clostridium, Bifidobacterium and Bacteroides hy-
drolyzed equally taurodeoxycholate and glycodeox
cholate, while the soluble fractions (extracellu
and intracellular material) showed a varying deg
of hydrolytic substrate specificity. Soluble hy
lase preparations from these bacteria suffered i
reversible loss of activity if prepared in the a
sence of a suitable reducing agent unless prepar
and stored in the absence of oxygen; and all sho
optimal activity below pH 6.0. Except in the ca
of enzymes that were equally active on all subst
(glycocholate, glycodeoxycholate, taurocholate,
taurodeoxycholate), enzymic activity was always
greater on glycine than on taurine conjugates, a
greater on trihydroxy than on dihydroxy acid con-
jugates; thus taurodeoxycholate was the least re
hydrolyzed of the four substrates. In studies o
product inhibition of cholanylglycine hydrolase
duced by 8.5mM free bile acids and other inhibit
all preparations showed similar properties in th
response.

3945 DEGRADATION OF STEROIDS BY INTESTINAL
BACTERIA: II. ENZYMES CATALYSING THE
DOREDUCTION OF THE 3α-, 7α- and 12α-HYDROXYL GRO
IN CHOLIC ACID, AND THE DEHYDROXYLATION OF THE 7
HYDROXYL GROUP. *(E.)* Aries, V. (St. Mary's Hosp
Med. Sch., London, England) and M. J. Hill. *Bio*
Biophys Acta 202(3):535-543, 1970.

ymes catalyzing the oxidoreduction of the 7α-,
and 12α-hydroxyl groups in cholic acid have been
ied in the cell-free state from strains of clos-
ia, bacteroides, bifidobacteria and entero-
eria isolated from human fecal specimens. Enzymes
ific for the 7α-hydroxyl group were isolated from
rains, those active on both the 3α- and 7α-
oxyl groups were isolated from 2 further strains,
an enzyme active on both the 3α- and 12α-hy-
yl groups from another strain. Those hydroxy-
lanyl dehydrogenases produced by the Gram-negative
eria (*E. coli* and *Bacteroides* spp.) were NAD+-
ndent while those from Gram-positive bacteria
welchii and *Bifidobacterium* spp.) required NADP+;
required oxygen, presumably as a terminal elec-
acceptor and all had a stable active site which
ars to bind to the free C-24 carboxyl group,
e methylated or conjugated acids were poor sub-
tes. In contrast to the hydroxycholanyl dehy-
enases, the 7-dehydroxylases studied required
obic conditions for activity, and were extremely
le, with optimum activity between pH 7.0 and 8.0
pared, for example, with 7α-hydroxycholanyl de-
ogenase with *Cl.welchii* at 9.8 to 10.2). Since
ugated bile acids are poor substrates for hy-
ycholanyl dehydrogenase and 7-dehydroxylase
mes, the major initial reaction in the catabolism
ile salts by intestinal bacteria seemingly is
olysis of the amide bond, to release free bile
s, which are good substrates for the hydroxy-
anyl dehydrogenase and, under strictly anerobic
itions, for the 7-dehydroxylase enzymes.

RADIOAUTOGRAPHIC STUDY ON THE INCORPORATION OF TRITIATED THYMIDINE BY MOUSE LIVER CELLS
NG RESTITUTION AFTER STARVATION.

(E.) Mori, K.
ka Hlth. Inst., Japan), M. Amano and B. Osogoe.
Histochem Cytochem 2(3):124-130, 1969.

incorporation of tritiated thymidine (5 µC s.c.,
ay for 10 days) into hepatic nuclei and the per-
ance of ^{3}H-labeled nuclei in the liver were
ied by autoradiography in adult male mice during
post-starvation (5 days) restitution period.
lerated incorporation of the precursor by the
r cells was seen immediately following the first
ction of tritiated thymidine during the restitu-
period and the maximum number of grains per
eus was in the range from 200 to 300. These
led cells made up more than 60% for the liver
nchymal cells and about half of the labeled cells
more than 30 grains per nucleus (these cells were
gnated as heavily labeled). The maximum number
rains for littoral cells was about 20 per nucle-
After 10 days of tritiated thymidine injection,
t 40% of the hepatic parenchymal cell nuclei were
ily labeled and one week after the last in-
ion, there was a greater incidence of labeling.
eafter, the percentage of labeled nuclei remained
ly constant (approximately 30%) and if lightly
led nuclei were taken into account, almost 80%
he parenchymal cell nuclei showed labeling of
. Except for the one week after the last in-
ion, the total percentage of labeled nuclei
roximately 60%) remained constant for 6 weeks.
incorporation of tritiated thymidine into littoral cells of the liver was also observed with 35 to 40% of these cells being labeled.

3947 COLD ACCLIMATION AND THYROXINE EFFECTS ON LIVER AND LIVER MITOCHONDRIAL FATTY ACIDS.

(E.) Patton, J. F. (U. Missouri Med. Sch., Columbia) and W. S. Platner. *Amer J Physiol* 218(5):1417-1422, 1970.

Relative concentrations of fatty acids from whole liver and liver mitochondria of rats cold acclimated for 6 to 7 weeks were analyzed by gas chromatography and the involvement of the thyroid gland was studied by the administration of propylthiouracil (PTU) or thyroxine to both warm- and cold-acclimated animals. Cold acclimation resulted in no change in total unsaturation of whole-liver fatty acids, but produced a decrease in total unsaturation of mitochondrial fatty acids. Injection of warm-acclimated rats with thyroxine also resulted in a decrease in unsaturation of mitochondrial fatty acids but no change occurred in whole liver. Treatment of cold-acclimated rats with PTU prevented the decrease in total unsaturation of mitochondrial fatty acids. Individual percent fatty acid changes in mitochondria of warm-acclimated, thyroxine-treated animals showed decreases in percent palmitate and linoleate and an increase in percent stearate, whereas PTU produced an increase in percent linoleate and a decrease in percent stearate. Liver mitochondria from cold-acclimated rats showed an increase in percent stearate. By decreasing the unsaturated moiety, thyroxine may alter the structure of the liver mitochondrial membrane causing altered enzymatic activity and permeability.

3948 THE *IN VIVO* BINDING OF METABOLITES OF 2-NAPHTHYLAMINE TO MOUSE LIVER DNA, RNA AND PROTEIN.

(E.) Hughes, P. E. (Baker Med. Res. Inst., Melbourne, Australia) and R. Pilczyk. *Chem Biol Interact* 1(3):307-314, 1970.

The binding of metabolites of 2-napthylamine to liver and kidney DNA, RNA and protein was demonstrated in CBA and C_{57} mice following a single injection of tritiated 2-napthylamine. The levels of binding of these metabolites were higher in the livers of CBA mice (susceptible to the carcinogenic effect of the compound) than in the carcinogenesis-resistant C_{57} strain in the case of binding to DNA, RNA and protein, and the levels of binding to the liver (susceptible organ) were found to be 40% higher than to the kidney (resistant organ). When strain or organ specificity were varied the binding of metabolites of 2-napthylamine to all 3 types of macromolecules correlated well with its carcinogenicity. The level of 2-napthylamine bound to CBA mouse-liver DNA 12 weeks after the administration of tritiated 2-napthylamine was 15% of the maximum level of binding. The distribution of 2-napthylamine in the liver was centrilobular while in the kidney binding occurs to transitional epithelium.

3949 METABOLISM OF LIVER AND PLASMA LIPIDS AFTER PARTIAL HEPATECTOMY IN THE RAT.

(E.) Fex, G. (Dept. Chem., U. Umea, Sweden). *Biochim Biophys Acta* 202(3):415-425, 1970.

The concentration and fatty acid composition of plasma and liver lipids and the metabolism of i.v. administered (^3H) oleic acid complexed to albumin was studied in partially hepatectomized or laparotomized rats. Partial hepatectomy as opposed to laparotomy induced significant elevations of the hepatic concentrations of glyceride (60 vs 9 moles/g wet tissue) and esterified cholesterol (15 vs 6 μmoles/g wet tissue) after 18 hr, while the concentrations of free cholesterol and phospholipid remained essentially unchanged. The main change in the fatty acid composition of liver lipids was increased percentages of mono- and diunsaturated fatty acids, and a decrease in the percentage of arachidonic acid in the phospholipid fraction. Partial hepatectomy as opposed to laparotomy brought about an increase in the concentration of plasma triglyceride (1.10 vs 0.31 μmoles/ml plasma) and a decrease in the ratio esterified/free cholesterol (0.99 vs 1.78). The fatty acid composition of the plasma lipid fractions showed changes similar to those which occurred in the corresponding liver lipid fractions. The fractional turnover rate of plasma free fatty acids was lower in partially hepatectomized than in laparotomized rats at 4 hr but not at 51 hr after operation but the flux of free fatty acids through the plasma, however, was not altered by partial hepatectomy. The incorporation of i.v. injected (^3H) oleic acid into neutral liver lipids was increased at 4 h (6.8%/g wet weight) but not at 51 h (1.8%/g wet wt.) after partial hepatectomy compared to laparotomy (2.5 and 2.1%/g wet wt., resp.). Data support the hypothesis that the fatty liver which follows partial liver resection is essentially the result of an increased incorporation of plasma free fatty acids into liver triglycerides.

3950 EFFECT OF THE ENTEROHEPATIC CIRCULATION OF BILE SALTS ON THE FLOW OF BILE AND ITS CONTENT OF BILE SALTS AND LIPIDS IN SHEEP.

(E.) Heath, T. (Sch. Physiol., U. New South Wales, Kensington, Australia), I. W. Caple and P. M. Redding. *Quart J Exp Physiol* 55(2):93-103, 1970.

When bile was diverted from the intestine of 4 sheep for 12 to 48 hr they secreted bile at a rate of about 0.31 ml/min, containing about 5.0 μEq total fatty acids, principally in phosphatidylcholine (about 48%) and lysophosphatidylcholine (about 31%). The output of total fatty acids increased when taurocholate was infused into the portal vein or duodenum, due to an increased secretion of phosphatidylcholine. Stimulation of total fatty acid secretion by bile salts was most marked at low rates of bile salt transfer, and reached a maximum when taurocholate was infused into the portal vein at 37 μM/min or more. The mean maximum output of total fatty acids in the bile of 12 sheep was about 15.2 μM/min. When ^{14}C-palmitic acid was infused into the portal vein with the taurocholate, it appeared in biliary phospholipids, and by the 6th hr of the infusion the level of radioactivity in bile was 8.3% of the rate of infusion. When taurocholate was infused into the portal vein at 45 μM/min or less it was transferred quantitatively into bile, but the efficiency of transfer decreased at higher infusion rates. Secretion of bile salts into bile was acc panied by increased secretion of water, but the volume of water accompanying each micromole of bi salt decreased with increases in the rate of secr tion. The bile flow did not increase further whe more than 127 μM/min taurocholate was infused int the portal vein, and in 4 sheep the maximum rate was about 1.06 ml/min. Availability of bile salt may limit secretion of phospholipid into bile whe the rate of secretion of bile salt is low, but wh large amounts of bile salt are secreted into bile apparently some other factor, possibly the rate c phospholipid synthesis, limits the secretion of phospholipids into bile.

3951 THE EFFECTS OF VAGOTOMY UPON BILIARY FUNCTION IN DOGS.

(E.) Amdrup, B. M. (U. Washington Sch. Med., Seattle) and C. A. Grif fith. *J Surg Res* 10(5):209-212, 1970.

Selective vagotomy was performed on 14 adult mong dogs to test the hypothesis that total vagotomy predisposes to the sequelae of nonvisualization c the gallbladder, biliary sludge, and cholelithias When hepatic and celiac vagi were left intact, po operative cholecystograms (with one dose of dye) showed excellent visualization of the gallbladder in all dogs but in dogs which underwent selective hepatic vagotomy, the gallbladder did not visuali at the third postoperative week until after a tri dose of dye (after 6 weeks, visualization was fai after a single dose). In the group with selecti hepatic and celiac vagotomy, a triple dose of dye was necessary to visualize the gallbladder 3, 6, and 10 weeks postoperatively. Hepatic and celia vagotomy did not alter the volume and motility of the gallbladder after 10 weeks, but this operati did result in decreased secretion of bilirubin ar neutral red in bile and decreased concentration c radiologic contrast material in the gallbladder.

3952 ASPECTS OF THE DETERMINATION OF BIPHENY HYDROXYLASE ACTIVITY IN LIVER HOMOGENAT I. EFFECT OF THE PRESENCE OF MITOCHONDRIA.

(E.) Bachmann, E. (Albany Med. Coll. New York), L. Goldberg and P. DiGiacomo. *Exp Molec Path* 12(2): 212-224, 1970.

The activity of the drug-metabolizing enzymes in 10,000*g* supernatant fraction from female rat live was measured in terms of biphenyl hydroxylation i the 2- and 4-positions. The addition of liver mi chondria from the same animals to the assay syste had no adverse effect when the organelles were fr ly isolated in mannitol-sucrose. If 1.15% KCl wa used for the isolation of mitochondria, the previ ly reported inhibitory effect (Axelrod 1956) coul be confirmed. Mitochondria isolated in mannitol-sucrose were found to exert an adverse effect on phenyl hydroxylation if they were preincubated at 37C for 30 min or stored for long periods at 4C, treatments leading to depletion of endogenous sub strate and concomitantly to a loss of semipermeab ity; or if they were frozen and thawed, thus brea the mitochondrial membranes. The hydroxylation c biphenyl in the 2- and 4-positions was affected

same extent. Addition of increasing amounts of
$^+$ and NADPH to the assay system stimulated bi-
yl hydroxylation 60 and 140% resp. When increas-
amounts of previously frozen mitochondria were
d to the assay system, correspondingly enhanced
bition of both 2- and 4-hydroxylation of biphenyl
lted. Mitochondrial inhibition of biphenyl
oxylation decreased with increasing amounts of
$^+$ or NADPH and the levels of pyridine nucleotides
eased.

3 FURTHER STUDIES ON LIVER GLYOXALASE ACTIVITY IN MICE BEARING LYMPHOSARCOMA.
Strzinek, R. A. (Dept. Biol. Sci., North
s St. U., Denton), G. R. Vela, V.E. Scholes and
J. Norton. *Cancer Res* 30(2):334-337, 1970.

variations in the activities of glyoxalase,
amic oxaloacetic transaminase and isocitric
dehydrogenase were compared in the livers of
al DBA/1J mice and in mice bearing a lympho-
oma tumor. The tumor used was a lymphosarcoma
h had been induced in laboratory mice by treat-
with 3-methyl-cholanthrene. Liver glyoxalase
ivity in normal mouse liver was 0.032 ± 0.001
/mg protein compared with a 44% decrease of
18 ± 0.001 i.u./mg protein in the livers of 7-
-old tumor-bearing mice. Glyoxalase specific
ivity in liver from 8.5-week-old mice bearing
12-day-old tumor was 0.22 ± 0.002 i.u./mg
tein and was 0.026 i.u./mg protein in mice 12
s old. Specific enzyme activities of glutamic
loacetic transaminase and isocitric acid dehy-
genase in normal mouse liver were 0.754 ± 0.021
0.014 ± 0.002, resp, compared with values of
47 ± 0.010 and 0.014 ± 0.003 in liver from tu-
-bearing mice. The activity of liver glyoxalase
tumor-bearing mice was initially increased by
over normal values after two days of tumor
th. The maximum activity levels of approxi-
ely 30% increase over control levels was reached
ays after tumor implantation. Liver glutamic
loacetic transaminase activity of tumor-bearing
e was also increased by 21% after two days of
or growth, and attained a maximum increase of
at 5 days after tumor implantation. The ac-
ities of both glyoxalase and glutamic oxaloace-
transaminase were markedly depressed in the
er 6 days after tumor implantation and attained
imum values (a decrease of 55% below control
ues) at 12 days after implantation. Activity
isocitric acid dehydrogenase was unaffected by
or implantation.

4 EFFECTS OF THYROXINE AND THYROIDECTOMY ON THE HYDROXYLATION OF TESTOSTERONE BY
ER MICROSOMES FROM MALE AND FEMALE RATS. *(E.)*
o, R. (Natl. Inst. Hyg. Sci., Tokyo, Japan),
Takahashi and Y. Omori. *Biochim Biophys Acta*
(1):116-124, 1970.

metabolism of [4-^{14}C]testosterone by liver
rosomes was investigated in male and female
s treated with L-thyroxine and then thyroidec-
ized. The incubation of [4-^{14}C]testosterone
h liver microsomes produced mainly hydroxylated
polar metabolites in normal male rats and Δ^4 reduced metabolites in female rats. Both the treatment with thyroxine and subsequent thyroidectomy markedly decreased the hydroxylation of [4-^{14}C]-testosterone by liver microsomes in male rats, but caused no significant alteration in female rats. The content of cytochrome P_{450} in the liver microsomes, the magnitude of testosterone-induced spectral change and the binding capacity of the cytochrome P_{450} with testosterone were decreased in thyroxine-treated male rats, but was not altered significantly in the thyroidectomized rats except for a slight decrease in the binding capacity of cytochrome P_{450}. The altered metabolism of steroid hormones may be related to the disturbance in the dynamics of steroid hormones in rats under abnormal states of thyroid function.

3955 THE SERUM ALANINE AMINOTRANSFERASE ACTIVITY AND THE TWO-HOUR SULPHOBROMOPHTHALEIN RETENTION TEST DURING DAILY LOW-DOSE GESTAGEN ORAL CONTRACEPTIVE TREATMENT. *(E.)* Larsson-Cohn, U. (U. Hosp., Uppsala, Sweden). *Acta Soc Med Upsal* 74(5-6):283-288, 1969.

3956 STUDIES ON ETHANOL-INDUCED STIMULATION OF GLUCOSE-6-PHOSPHATASE ACTIVITY. *(E.)* Nelson, P. (U. Colorado Med. Sch., Denver), S. R. Wagle and J. Ashmore. *Metab Clin Exp* 19(5):349-353, 1970.

3957 EFFECT OF ROSE BENGAL ON BILE SECRETION IN THE RABBIT: INHIBITION OF A BILE SALT-INDEPENDENT FRACTION. *(E.)* Dhumeaux, D. (Hosp. Beaujon, Clichy, France), S. Erlinger, J. P. Benhamou and R. Fauvert. *Gut* 11(2):134-140, 1970.

3958 STIMULATING EFFECT OF HAEMIN ON THE SYNTHESIS OF CYTOCHROME *C* BY LIVER SLICES. *(E.)* Gonzalez-Cadavid, N. F. (Fac. Sci., Central U., Caracas, Venezuela), M. Wecksler and M. Bravo. *FEBS Letters* 7(3):248-250, 1970.

3959 $^{65}Zn^{2+}$ UPTAKE BY RAT LIVER NUCLEI IN PRESENCE OF SOME CHELATING AGENTS. *(E.)* Weser, U. (Physiol. Chem. Inst., U. Tubingen, Germany) and H. Brauer. *Biochim Biophys Acta* 204(2):542-549, 1970.

3960 ALKOXYLIPIDS: VI. MOLECULAR STRUCTURES OF THE NEUTRAL ALKOXYLIPIDS OF RATFISH LIVER. *(E.)* Baumann, W. J. Hormel Inst., U. Minnesota, Austin), T. Takahashim, H. K. Mangold and H. H. O. Schmid. *Biochim Biophys Acta* 202(3):468-476, 1970.

3961 EFFECT OF OVARIAN HORMONES ON THE INCORPORATION OF ^{32}P INTO TISSUE FRACTIONS BY MAMMARY GLAND AND LIVER OF ADULT VIRGIN RATS. *(E.)* Majumdar, G. C. (Natl. Dairy Res. Inst. Karnal, India) and N. C. Ganguli. *Indian J. Biochem* 6(4): 216-219, 1970.

3962 THE INFLUENCE OF 2,4-DINITROPHENOL ON METABOLIC CHANGES CAUSED BY ETHANOL IN THE PERFUSED RAT LIVER. *(E.)* Vendsborg, P. B. (Dept. Biochem. A, U. Copenhagen, Denmark) and P. Schambye. *Acta Pharmacol Toxic* 28(2):113-123, 1970.

3963 IMMUNOCHEMICAL MEASUREMENT OF VITAMIN-K-INDUCED BIOSYNTHESIS OF PROTHROMBIN IN THE ISOLATED PERFUSED RAT LIVER. *(E.)* Li, L. F. (St. Louis U. Sch. Med., Mo.), R. K. Kipfer and R. E. Olson. *Arch Biochem Biophys* 137(2):494-499, 1970.

3964 TRANSPLANTATION OF THE LIVER. *(E.)* Orloff, M. J. (Sch. Med. U. California, San Diego), J. G. Chandler and J. E. Bernstein. *Recent Results Cancer Res* 26:213-239, 1970.

3965 LIVER REGENERATION. *(E.)* Bengmark, S. (Dept. Surg., U. Goteborg, Sweden). *Recent Results Cancer Res* 26:187-212, 1970.

3966 DRUGS AND THE LIVER: A REVIEW OF METABOLISM AND ADVERSE REACTIONS. *(E.)* Schaffner, F. (Mt. Sinai Sch. Med., City U. New York, New York) and I. H. Raisfeld. *Advances Intern Med* 15:221-251, 1969.

3967 GLUCOGON INFUSION, PLASMA FFA AND TRIGLYCERIDES, BLOOD SUGAR AND LIVER LIPIDS IN BIRDS. *(E.)* Grande, F. (Mt. Sinai Hosp., Minneapolis, Minn.) and W. F. Prigge. *Amer J Physiol* 218(5): 1406-1411, 1970.

3968 RELATIVE ALBUMIN, TRANSFERRIN AND FIBRINOGEN SYNTHESIS RATES IN PERFUSED BOVINE LIVER. *(E.)* Goldsworthy, P. D. (U. Washington Sch. Med., Seattle), H. R. McCartor, J. E. McGuigan, G. F. Peppers and W. Volwiler. *Amer J Physiol* 218(5):1428-1433, 1970.

3969 THE EFFECTS OF ALDEHYDES ON SEROTONIN METABOLISM IN RAT LIVER SLICES. *(E.)* De Breyer, I. J. J. (Pharm. Inst. U. Hamburg, Germany), A. Ortiz and K. Soehring. *Pharmacology* 3(2):85-90, 1970.

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3971 DEPENDENCE ON AGE AND SEX OF BENZO(A)PYREN METABOLISM *IN VITRO* BY MICROSOMAL ENZYMES FROM RAT LIVER. *(Ger.)* Dehnen, W. (Med. Inst. U. Dusseldorf, Germany), R. Tomingas and H. Schagholi. *Z Krebsforsch* 73(4):363-370, 1970.

3972 THE ACTION OF TOTAL LIVER EXTRACT UPON HEPATIC REGENERATION. *(Fr.)* Loeper, J. (Fac. Hosp. St. Antoine, Paris, France), R. Comper and J. Loeper. *C R Soc Biol* 163(6):1346-1350, 196

3973 HEPATIC XANTHINE OXIDASE ACTIVITY IN THE NEWBORN AND INFANT. *(It.)* Zacchello, F. (Pediat Clin. U. Padua, Italy) and F. F. Rubaltell *Acta Paediat Lat* 22(5):611-617, 1969.

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3975 BIOSYNTHESIS OF STEROID GLUCURONIDES IN TESTOSTERONE PERFUSED RAT LIVER: SEX SPECIFICITY. (*Ger.*) Schriefers, H. (Dept. Biochem U. Ulm, Germany), R. Ghraf and M. Brodesser. *Acta Endocr* 63(1):59-68, 1970.

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3977 TESTOSTERONE METABOLISM IN THE ISOLATED PERFUSED RAT LIVER. (*Ger.*) Staib, R. (Inst. Physiol. Chem., U. Dusseldorf, Germany), R Sonnenschein and W. Staib. *Europ J Biochem* 13(1) 142-148, 1970.

3978 LIVER TRANSPLANT IN MAN. (*Ger.*) Thiel, (Med. U. Clin., Basle, Switzerland). *Schweiz Med Wschr* 100(5):238-239, 1970.

3979 THE CURRENT STAGE OF LIVER TRANSPLANT. (*Fr.*) Garnier, H. (no affil). *Bull Me Soc Med Paris* 172(7):28-35, 1969.

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3981 DNA BINDING OF 3'-METHYL-P-DIMETHYLAMIN AZOBENZENE IN THE REGENERATING RAT LIVE AND OTHER ORGANS. *(It.)* Prodi, G. (Inst. Gen. Pa U. Bologna, Italy), C. Finzi and C. Franceschi. *Boll Soc Ital Biol Sper* 45(1):24-25, 1969.

3982 THE CONVERSION OF VALINE TO PROPIONYL-CARNITINE IN ISOLATED RAT LIVER MITOCHO DRIA. *(E.)* Bohmer, T. (Inst. Clin. Biochem., U. Oslo, Norway). *Biochim Biophys Acta* 208(1):167-1 1970.

83 INFLUENCE OF VITAMINS AND AMINOACIDS ON CELL PROLIFERATION KINETICS IN THE RE- NERATING LIVER. *(It.)* Bazzicalupo, G. (Dept. meiotic Med., U. Parma, Italy), P. Pietanera and Vernasca. *Minerva Med* 61(18):845-854, 1970.

84 LIVER REGENERATION IN THE THYMECTOMIZED ADULT RAT: ANESTHESIA AND RESPIRATORY NTROL DURING SURGERY. *(It.)* Forabosco, A. (Inst. rm. Human Anat., U. Trieste, Italy) and L. Er- lessi. *Boll Soc Ital Biol Sper* 45(6):354-356, 70.

85 LIVER REGENERATION IN THE THYMECTOMIZED ADULT RAT: MITOSIS IN THE 30th HR OF E PROCESS. *(It.)* Forabosco, A. (Inst. Norm. man Anat., U. Trieste, Italy) and P. Narducci. *ll Soc Ital Biol Sper* 45(6):356-359, 1969.

86 LIVER REGENERATION IN THE THYMECTOMIZED ADULT RAT: DNA SYNTHESIS IN THE 30th OF THE PROCESS. *(It.)* Forabosco, A. (Inst. rm. Human Anat., U. Trieste, Italy) and G. Toni. *ll Soc Ital Biol Sper* 45(6):359-361, 1969.

87 LIVER REGENERATION IN THE THYMECTOMIZED ADULT RAT: HEPATIC STRUCTURE IN THE 30th OF REGENERATION. *(It.)* Forabosco, A. (Inst. rm. Human Anat., U. Trieste, Italy) and F. Guli. *ll Soc Ital Biol Sper* 45(6):361-363, 1969.

3988 LIVER REGENERATION IN THE THYMECTOMIZED ADULT RAT: HISTOCHEMISTRY OF VARIOUS DEHYDROGENASES IN THE 30th HR OF REGENERATION. *(It.)* Forabosco, A. (Inst. Norm. Human Anat., U. Trieste, Italy), F. Bratina and P. Narducci. *Boll Soc Ital Biol Sper* 45(6):363-365, 1969.

3989 ATP-ASE ACTIVITY IN LIVER TISSUE IN CASTRATED ANIMALS. *(Pol.)* Krolikowska-Prasal, I. (Acad. Med., Lublin, Poland). *Pat Pol* 20(4):407-412, 1969.

3990 EXPERIMENTAL LIVER TRANSPLANT: ANATOMY AND FUNCTION. *(Sp.)* Alvarez Cordero, R. (Gen. Hosp., Nat. Med. Ctr., Mexico), M. Guerrero Alcazar, M. Lopez Cortes, N. Martinez Toro, F. Robles Orozco, J. Zavala Reyes and M. Quijano Narezo. *Rev Med IMSS* 8(3):210-220, 1969.

- P:Morph (3790) (3797) (3799) (3800) (3802) (3804) (3805) (3810) (3813) (3814) (3815) (3817) (3818) (3819) (3821) (3824) (3825) (3826) (3829) (3831) (3832) (3837) (3839) (3841) (3842) (3844) (3845) (3846) (3849) (3850) (3851) (3855) (3856) (3857) (3858) (3859)(3861)
- P:Absorp (3875)
- P:Motil (3900)
- Diagproc (4044) (4045)
- D:Livbil (4360) (4375) (4386) (4387) (4388) (4396) (4401) (4403) (4434) (4442)
- D:Livbil:A.Nonv.Hep (4450) (4451) (4452) (4461) (4462) (4469) (4471) (4472)
- D:Livbil:A.V.Hep (4478) (4485) (4494)
- D:Livbil:C.Hep (4503)
- D:Livbil:Cirrh (4506) (4508) (4517)
- D:Livbil:Gallb (4531) (4535)
- D:Gen (4569)

SECRETION AND METABOLISM

Intestine

91 ON THE NATURE OF CIRCULATING LIPOPROTEINS OF INTESTINAL ORIGIN IN THE RAT. *(E.)* ndmueller, H. G. (Natl. Inst. Arthritis Metab. s., Natl. Inst. Hlth., Bethesda, Md.), F. T. ndgren, W. J. Lossow and R. I. Levy. *Biochim ophys Acta* 202(3):507-516, 1970.

e size distribution of intestinal lymph and asma lipoproteins in rats on a fat-free diet and ter fat feeding was determined by analytical and eparative density gradient ultracentrifugation, d discrete subfractions were analyzed for lipids d protein. Lymph and plasma were obtained from ts fed the diets supplemented with 2% of orotic id as well as from controls fed the same diets thout orotic acid. The spectrum and composition lymph lipoproteins in controls and in orotic id-fed rats were similar under all dietary con- tions. On a fat-free diet, lymph contained a continuous range of lipoproteins between s_f 20 and s_f 3200, with most being in the s_f 60 to 1100 range. After fat feeding, $s_f > 3200$ particles predominated, s_f 400 to 3200 particles increased greatly, and the amount of s_f 20 to 400 lipoproteins was relatively unchanged. Lymph had negligible amounts of s_f 0 to 20 and high-density lipoproteins, while in plasma, high density lipoproteins predominated under all dietary conditions. On a fat-free diet, control plasma contained some s_f 60 to 1100 lipoproteins, and after fat feeding a small smount of $s_f > 1100$ lipoproteins was found. Plasma from orotic acid-fed rats was virtually devoid of all $s_f > 0$ lipoproteins before and after fat feeding. In lymph and plasma lipoproteins, the relative content of protein and phospholipid decreased and triglyceride increased with increasing particle size. Lipoproteins isolated from lymph contained relatively more phospholipid and less protein than fractions of corresponding s_f value isolated from plasma.

3992 DEVELOPMENT OF THE LYMPHOID TISSUE IN THE RABBIT APPENDIX ISOLATED FROM THE INTESTINAL TRACT.

(E.) Stramignoni, A. (Inst. Anat. Path. Histol., U. Turin, Italy), F. Mollo, S. Rua and G. Palestro. *J Path* 99(4):265-269, 1970.

The development of lymphoid tissue in the distal part of the rabbit appendix following surgical detachment from the intestinal tract at birth was studied in 54 newborn rabbits. In 22 animals (Group 1) the distal segment of the appendix was left *in situ* with the lumen open to the peritoneal cavity and the vascular connections intact, to study the role of stimulation from the intestinal tract on lymphoid tissue development. In 32 animals (Group 2), the distal part of the appendix was excised completely and either left free without vascular connections, or was transplanted into the anterior chamber of the eye of the same animal. Animals from Group 1 were sacrificed after 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13 and 14 days; those from Group 2 were killed after 5 or 10 days, and proximal and distal parts of the appendix were fixed, sectioned and stained with hematoxylin and eosin, methyl green and Giemsa's stain. At death the proximal segment of the appendix was longer and thicker than the distal portion in all experimental animals. The distal segment of the appendix of all animals in Group 1 was suitable for examination, but covered with adhesions, in 8 of 32 animals from Group 2; in the other animals of this group, the segment was not recovered or was necrotic. The developme of lymphoid tissue in the proximal part of append was similar to that in intact appendices. In dis appendix specimens from Group 1, the lymphoid tis was underdeveloped, the follicles were less promi than in the proximal segment, and no obvious germ centers were seen. In Group 2, no lymphoid tissu was found in appendices that lacked both intestin and vascular connections. Blood supply seemingly one of the most important factors for the develop of appendicular lymphoid tissue.

3993 DETERMINATION OF DISACCHARIDASE ACTIVI IN THE HUMAN INTESTINAL MUCOSA. *(It.)*

Ciccimarra, F. (U. Naples, Italy), E. Starace and Vegnente. *Boll Soc Ital Biol Sper* 45(6):336-340,

- P:Morph (3791) (3796) (3798) (3823) (3838) (3840) (3852) (3853)
- P:Absorp (3863) (3867) (3872) (3877) (3881)
- P:Motil (3885) (3891) (3892) (3899) (3901)
- Diagproc (4064)
- D:Stomduo:Peptulc (4208)
- D:S.Intest:Malabs (4252)
- D:L.Intest (4300) (4303)
- D:Gen (4595) (4596) (4632) (4636) (4653)

GENERAL

3994 EFFECT OF ACTIVE OR PASSIVE IMMUNIZATION ON THE LIGATED RABBIT INTESTINE TO *SHIGELLA FLEXNERI* INFECTION.

(E.) Ogawa, H. (Dept. Path., Natl. Inst. Hlth., Tokyo, Japan) and A. Nakamura. *Jap J Med Sci Biol* 22(6):351-362, 1969.

The relations between the development of inflammatory response and invasion of *Shigella* into the mucosa were studied in the ligated intestine of rabbits immunized actively or passively through different routes. When the intestinal segments of rabbits, pretreated with heat-killed virulent or avirulent *Shigella flexneri 2a* or perfused i.v. with antiserum, were challenged with a virulent strain (*Shigella flexneri 2a 5503*), they responded with hypersensitivity reactions, characterized by an enhanced circulatory disturbance and necrosis of the mucosa, especially in epithelial lining. The invasion of *Shigella flexneri 2a* into the mucosa was not prevented by the immune-treatment. The hypersensitivity reaction was more remarkable in the large intestinal (colon) segments than those of the small intestine. Neither dilatation nor inflammatory response of the segments in immune-treated animals were observed either in the case of challenge with an avirulent strain (*Shigella flexneri 2a 5503-I*), which was lacking in ability to penetrate into the mucosa, or in the challenge with a heat-killed virulent strain. When injecte with antiserum into the intestinal segments at th same time of challenge, the penetration of a virulent strain into the mucosa as well as the dilatation of the segments due to inflammatory response were effectively inhibited.

3995 THE METABOLISM OF PARENTERAL IRON CHELA

(E.) Rubin, M. (Georgetown U. Sch. Med Dent., Washington, D.C.), E. Pachtman, M. Aldridg E. J. Zapolski, D. H. Bagley, Jr. and J. V. Princ otto. *Biochem Med* 3(4):271-288, 1970.

The metabolism of a series of parenterally admini tered amino acid iron chelates (containing 0.10 µ of Fe^{59}) was studied in iron-deficient rats on a diet of powdered milk and distilled water. After to 8 weeks, iron-deficient rats weighed approxima 150 grams and their hemoglobin levels were below gm/100 ml. Normal rats were fed a standard labor tory rat diet, and their hemoglobin levels varied 13 to 15 gm/100 ml. The distribution and excreti of iron injected in the form of water-soluble low molecular weight chelates was dependent upon the physical and chemical nature of the iron chelate s molecular structure. The strong anionic hydro-ilic iron chelates provided the least iron scission d highest urinary excretion. The urinary excretion iron in the form of FeEDTA at a dose of 2 ug Fe/kg d at a higher dose of 3 mg Fe/kg was complete in 2 after injection. At the lower dose, 2% of the jected iron was eliminated in the urine, while at e higher dose of 3 mg Fe/kg, 55 to 65% of the iron s eliminated in the urine. A second group of less lar iron chelates, including NTA, EHPG, and CH_3EHPG, llowed a distribution pattern which provided gastro-testinal as well as urinary excretion. Iron from a ird class of iron chelates, of binding strength wer than transferrin, was retained and widely dis-ibuted after parenteral injection. For all iron mpounds, the anemic rat utilized iron more effi-ently than the normal rat. The mode of utilization s variable and was a consequence of tissue binding upled with an enhanced diffusibility of the iron elates in anemia.

96 THE NEUTRALIZATION OF CHOLERA VASCULAR PERMEABILITY FACTOR *IN VIVO*. *(E.)* Craig, P. (Downstate Med. Ctr. St. U. New York, Brooklyn). *Infect Dis* 121(supp.):S100-S110, 1970.

97 CHARACTERIZATION AND PURIFICATION OF CHOLERA TOXIN. *(E.)* Heckly, R. J. (Sch. bl, Hlth., U. California, Berkeley) and H. lochow. *J Infect Dis* 121(supp.):S80-S84, 1970.

98 PURIFICATION AND PROPERTIES OF PERMEABILITY FACTOR/CHOLERA ENTEROTOXIN FROM MPLEX AND SYNTHETIC MEDIA. *(E.)* Richardson, H. (Bowman Gray Sch. Med., Wake Forest U., nston-Salem, N.C.) and K. A. Noftle. *J Infect s* 121(supp.):S73-S79, 1970.

99 PRODUCTION, PURIFICATION, AND ASSAY OF CHOLERA ENTEROTOXIN. *(E.)* Grady, G. F. t. Lab. Inst., Boston, Mass.), R. C. Duhamel and Talbot. *J Infect Dis* 121(supp.):S85-S91, 1970.

00 THE DETERMINATION OF SERUM IRON AND TOTAL IRON-BINDING CAPACITY WITH TEEPOL. *(E.)* lenbrander, H. J. (St. Clara Hosp., Rotterdam, therlands) and C. L. J. Vink. *Clin Chim Acta* (1):175-184, 1970.

01 INTRAHEPATIC DISTRIBUTION OF HEPATIC BLOOD FLOW: SINGLE INPUT STUDIES. *(E.)* iffen, W. O. Jr. (U. Minnesota Med. Sch., Minnea-lis), D. G. Levitt, C. J. Ellis and N. Lifson. *er J Physiol* 218(5):1474-1479, 1970.

02 INTRAHEPATIC DISTRIBUTION OF HEPATIC BLOOD FLOW: DOUBLE INPUT STUDIES. *(E.)* fson, N. (U. Minnesota Med. Sch., Minneapolis), G. Levitt, W. O. Griffen Jr. and C. J. Ellis. *er J Physiol* 218(5):1480-1488, 1970.

03 NEUROHORMONAL CONTROL OF GASTRIC BLOOD FLOW. *(E.)* Jansson, G. (Dept. Physiol., Goteborg, Sweden), O. Lundgren and J. Martinson. *stroenterology* 58(3):425-429, 1970.

4004 PRODUCTION OF HIGHLY PURIFIED CHOLERAGEN AND CHOLERAGENOID. *(E.)* Finklestein, R. A. (U. Texas Southwestern Med. Sch., Dallas) and J. J. LoSpalluto. *J Infect Dis* 121(supp.):S63-S72, 1970.

4005 PRELIMINARY STUDIES ON THE BIOASSAY OF ANTICHOLERA VACCINES IN CHINCHILLAS. *(E.)* Pickett, M. J. (Dept. Bacteriol, U. California, Los Angeles), S. Basu and R. L. Robinson. *J Infect Dis* 121(supp.):S56-S57, 1970.

4006 SEPARATION OF PROTECTIVE BACTERIAL SUBSTANCES AGAINST EXPERIMENTAL *VIBRIO* INFECTION. *(E.)* Yoshioka, M. (Kitasato Inst., Tokyo, Japan), K. Takahashi, T. Hirano, Y. Kazuno, S. Takeuchi, Y. Akiba, A. Ghoda, T. Suzuki and Y. Suzuki. *J Infect Dis* 121(supp.):S45-S49, 1970.

4007 CONCENTRATION AND PURIFICATION OF CHOLERA EXOTOXIN BY ABSORPTION ON ALUMINUM COMPOUND GELS. *(E.)* Spyrides, G. J. (Eye Res. Found., Bethesda, Md.) and J. C. Feeley. *J Infect Dis* 121(supp.):S96-S99, 1970.

4008 TITRATION OF CHOLERA ENTEROTOXIN AND ANTITOXIN IN ISOLATED FAT CELLS. *(E.)* Greenough, W. B., III (Baltimore City Hosp., Md.), N. F. Pierce and M. Vaughan. *J Infect Dis* 121(supp.):S111-S114, 1970.

4009 A RAPID EXTRACTION AND QUANTIFICATION OF TOTAL LIPIDS AND LIPID FRACTIONS IN BLOOD AND FECES. *(E.)* Amenta, J. S. (U. Pittsburgh Sch. Med., Pa.). *Clin Chem* 16(4):339-346, 1970.

4010 THE ACTION OF ANTIBIOTICS AND CHEMOTHERAPEUTICS UPON THE RAT INTESTINAL FLORA. *(It.)* Guerra, M. C. (Dept. Pharm. Pharmaceut., U. Bologna, Italy) and G. Cantelli Forti. *Boll Soc Ital Biol Sper* 45(1):32-36, 1969.

4011 MICROFLORA OF THE GASTROINTESTINAL TRACT: A ZOOLOGICAL STUDY. *(Fr.)* Ducluzeau, R. (no affil). *Rev Immunol* 33(6):345-384, 1969.

4012 PHARMACOLOGY OF LIVER PERFUSION. (*Ger.*) Zockler, E. (Med. Coll. Hannover, Germany) and R. Friedel. *Z Gastroent* 8(1):3-23, 1970.

4013 CUCURBITACINES: RELATIONS BETWEEN STRUCTURE, TOXICITY AND LAXATIVE ACTION. *(Fr.)* Le Men, J. (Fac. Med. Pharm., Reims, France), G. Buffard, J. Provost, R. Tiberghien, P. Forgacs, E. La Grange, O. Albert and M. Aurousseau. *Chim Ther* 4(6):459-465, 1969.

- P:Morph (3816)
- P:Secr:Hepatobil (3945)
- D:Gen (4633)
- D:Gen:Parasit (4664)

DIAGNOSTIC PROCEDURES

4014 ALDOLASES AS LIVER FUNCTION TESTS: FRUCTOSE-1-PHOSPHATASE AND FRUCTOSE-1,6-DIPHOSPHATASE.

(E.) Kaldor, J. (Fairfield Hosp., Victoria, Australia). *Clin Chim Acta* 28(1): 145-148, 1970.

Serum fructose-1-phosphatase and fructose-1,6-diphosphatase and SGOT values were determined in 250 patients with hepatobiliary disease and in normal subjects. Normal values were: SGOT, 5-40 Karmen units; fructose-1-phosphatase, 0-4 dehydrogenase units; and fructose-1,6-diphosphatase, 1-20 dehydrogenase units. Pronounced increases in values for each enzyme occurred in patients in the early stages (0-2 weeks) of infectious hepatitis while values for SGOT and fructose-1,6-diphosphatase were normal and the value for fructose-1-phosphatase remained elevated in patients with prolonged (4-6 weeks and over) infectious hepatitis. Values for fructose-1-phosphatase and fructose-1,6-diphosphatase were markedly increased in patients with alcoholic hepatitis or cirrhosis.

4015 USEFULNESS OF SERUM LIPASE, ESTERASE AND AMYLASE ESTIMATION IN THE DIAGNOSIS OF PANCREATITIS—A COMPARISON.

(E.) Song, H. (Mt. Sinai Hosp. Med. Ctr., Chicago, Ill.), N. W. Tietz and C. Tan. *Clin Chem* 16(4):264-268, 1970.

Sera of 19 patients with clinically established pancreatitis were analyzed for lipase activity on six different emulsion-type and aqueous substrates, and serum amylase concentrations were compared. The methods for lipase activity determination in which an olive oil emulsion-type substrate were of the greatest aid in diagnosing pancreatitis. The method of Tietz and Fiereck, using an olive oil emulsion (50 ml/100 ml) and a Tris buffer with a pH of 8.0, detected an average increase of 480% in serum lipase and amylase activity in 17 (90%) of 19 patients tested. A second method, by Vogel and Zieve and using olive oil substrate (0.04 ml/100 ml at pH 9.1) detected an average increase of 490% in serum lipase and amylase activity in 11 (92%) of 12 patients tested. Amylase determinations showed a 341% increase in activity in 14 (78%) of 18 patients tested by this method, but lipase values obtained with methods in which aqueous substrates were used gave only 29% and 32% correlation, and were of limited clinical usefulness. Serum lipase elevations in cases of pancreatitis were generally greater than amylase elevations and serum lipase and amylase values generally supplemented one another.

4016 HEPATIC PHOTOSCANNING AS AN AID IN DETERMINING TREATMENT POLICIES FOR CANCER INVOLVING THE LIVER.

(E.) Ariel, I. M. (Hosp. Joint Dis., New York, N. Y.), G. T. Pack and D. W. Molander. *Recent Results Cancer Res* 26:95-115, 1970.

The performance of the hepatic photoscan technique in detection of metastases in the liver, in determining the nature of hepatomegaly, in differentiating intrahepatic and extrahepatic abdominal masses and in determining blood flow to hepatic cancer was analyzed in 500 hepatic photoscans from patients with int
abdominal cancer. The isotopes used most common
were radioactive iodine-131 rose bengal, and gol
198. In 196 patients a diagnosis of metastic ca
was made at time of laparotomy or at necropsy.
tic photoscan technique made a correct diagnosis
85.2% of the 196 patients, a false positive diag
in 9.7% and a false-negative diagnosis in 5.1%.
greatest number of scans were performed on patie
with primary cancer of the colon and rectum (129
cases). Of these, 77 patients had diagnosis con
firmed by hepatic scan. The percent of correct
diagnosis by liver scan in this group was 85.7%;
false positive was 9.1% and false negative was 5
The scan technique aided in determining the natu
hepatomegaly in 92 patients by demonstrating the
tions of the liver replaced by cancer, as well a
areas of compensatory hyperplasia. Hepatic scan
aided in differentiating an abdominal mass in ju
position to the liver from an intrinsic hepatic
and in 95 patients the scan aided in determining
whether cancer chemotherapy was indicated. Hepa
photoscanning was an aid in following the course
treatment of patients with lymphomas and hepatic
cer, in determining the blood flow to the hepati
cancers and in studying liver regeneration after
hepatic lobectomy.

4017 DOUBLE-BLIND STUDY OF ENDOSCOPY PREMED
CATIONS.

(E.) Dunn, G. D. (U. Kansas
Med., Kansas City), R. H. Kubin, R. R. Laing, C.
Sisk and A. P. Klotz. *Gastroint Endosc* 16(4):22
1970.

In one group, endoscopic procedures (using the E
Hufford esophagoscope, the Eder-Palmer gastrosco
and the Hirschowitz Fiberscope) with 4 drug regi
(Meperidine 25 mg i.m., Meperidine 25 mg and Pro
zine 50 mgm i.m., Meperidine 25 mg and Chlordiaz
ide 50 mgm i.m., and Meperidine 25 mg and Phenob
tal 100 mg i.m.), performed in a series of 66 co
tive patients (ages 23-84; 28 female, 38 male),
vealed no significant difference in patient perf
ance with the various instruments and drug regim
In another group, 127 patients (ages 13-81; 75 f
52 male) undergoing examination with the Olympus
gastrocamera were studied, using Meperidine (1.0
0.5 mg/kg) and placebo. The overall results ind
that Meperidine improved patient cooperation (wh
compared to placebo) and that Meperidine alone w
effective as any drug combination used, with sub
tive side effects being directly related to the
of the premedication (not to patient cooperation
Preoperative interview or psychological testing
nesota Multiphasic Personality Inventory) failed
predict which patients might perform poorly. Im
proved performance was found in older patients a
in patients with previous endoscopy.

4018 OBSERVER VARIATION IN THE CLINICAL AND
RADIOLOGICAL ASSESSMENT OF HEPATOSPLEN
MEGALY.

(E.) Blendis, L. M. (King's Coll. Hosp.
London, England), W. J. McNeilly, L. Sheppard, F
Williams and J. W. Laws. *Brit Med J* 1(5698):727
730, 1970.

nical and radiological examination (by a plain
ominal radiograph) were used to evaluate the size
the liver and spleen of 32 patients (14 with blood
crasias, 10 with chronic liver disease, 8 with
er conditions). Radiological assessment was found
be subject to less variation than clinical evalua-
n, particularly in regard to the liver. Large
ers and spleens were more easily seen radiolog-
lly than small ones. Most of the variation among
radiologists arose because of the 6% and 24% of
cases in which the liver and spleen, resp., were
rly seen on the radiograph. A plain radiograph of
abdomen, including the diaphragm with the costal
gin indicated, seemingly is a useful adjunct to
nical examination.

9 SELECTIVE CELIAC ANGIOGRAPHY. *(E.)* Voss, D. M. (Marshfield Clin., Wisconsin) and
. Olsen. *Wisconsin Med J* 69(4):129-132, 1970.

ctive celiac axis arteriography was performed
109 patients who had suspected carcinoma of the
creas, abdominal pain of unknown etiology, known
astatic carcinoma, regional perfusion with
otherapeutic agents, suspected vascular lesions,
sive hepatosplenomegaly of unknown etiology, or
preoperative splenoportogram. Selective celiac
heterization was successfully performed in 90
ients with the other 19 failing due to either
reme tortuosity of the aortic arch or iliac
sels, or to complete occlusion of the celiac
s. Congenital variations from the normal vas-
ar structure were seen in 18 patients, suggestion
arcuate ligament syndrome was seen in 5 patients,
ignant disease was suspected in 23 patients and
patients carcinoma of the pancreas was diag-
ed. In 13 patients liver metastases were rec-
ized and in 1 patient, hepatoma was suspected.
ormal hepatic vessels in 3 patients were com-
ible with liver cirrhosis. This procedure
ingly provides helpful additional information
bscure abdominal pain syndromes and suspected
reatic neoplasm or vascular insufficiency
dromes.

0 RADIOLOGY IN ULCERATIVE COLITIS. *(It.)* Dalla Palma, L. (Major Hosp. Trieste,
ly). *Minerva Med Giuliana* 9(2):91-104, 1969.

1 LABORATORY TESTS IN THE DIAGNOSIS OF ULCERATIVE COLITIS. *(It.)* D'Acunzo, L.
ted Hosp., Trieste, Italy). *Minerva Med*
iana 9(2):112-114, 1969.

SORBITOL IN ENDOVENOUS CHOLANGIOCYSTOGRAPHY: FIRST EXPERIENCE. *(It.)* Pannuti,
(Inst. Clin. Gen. Med., Med. Ther. U. Bologna,
ly) and P. Pavlica. *Ann Radiol Diagn* 42(4):
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GASTROINTESTINAL DISEASES

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4121 DIFFUSE LEIOMYOMATOUS HYPERPLASIA OF T ESOPHAGUS. *(It.)* Fantoni, P. A. (Inst Path. Spec. Surg., U. Padua, Italy), A. Algni an L. A. Marin. *Arch Chir Torac Cardiovasc* 23(4):2 287, 1969.

4122 CANCER OF THE ESOPHAGUS: FURTHER EVID OF THE RELATION TO DRINKING HABITS IN FRANCE. *(E.)* Tuyns, A. J. (Int. Agency Res. Can Lyon, France). *Int J Cancer* 5(1):152-156, 1970.

4123 HISTOLOGY OF EXPANDED EPITHELIAL HETER TOPIA OF THE LOWER ESOPHAGUS. *(Fr.)* Savary, M. (Clin. Oto-Rhino-Laryng. U. Lausanna, Switzerland), J. Fasel and M. Monti. *Rev Med Suisse Rom* 90(1):37-44, 1970.

4124 ULCER OF THE CARDIA. *(Ger.)* Kaufer, C (Surg. U. Clin., Bonn, Germany), K. H. Schriefers and M. Plorin. *Bruns Beitr Klin Chir* 17(8):715-720, 1969.

4125 SEVERE HEMORRHAGE IN ESOPHAGEAL VARICE CERVICAL LYMPHO-VENOUS ANASTOMOSIS. *(G* Ungeheuer, E. (Northwest Hosp., Frankfurt, Germa and H. Dalichau. *Thoraxchirurgie* 17(6):525-528, 1969.

4126 ESOPHAGEAL MOTILITY CHANGES IN PROGRES SYSTEMIC SCLEROSIS. *(Sp.)* Degollado, (Hosp. Gen. Ctr. Med. Natl. I.M.S.S., Mexico), L Elizondo, R. Z. Banos and V. Guarner. *Rev Mexic Radiol* 23(1):33-41, 1969.

- P:Motil (3897)
- Diagproc (4055)
- D:L.Intest (4305)
- D:Livbil:Cirrh (4515) (4518)
- D:Gen (4611)
- D:Gen:Parasit (4662) (4675)

7 INFLUENCE OF SOME DRUGS INJURIOUS TO GASTRIC MUCOSA ON GASTRIC AMMONIA FORMATION. *(E.)* anabe, K. (Nagoya City U., Japan), N. Ishida and Fukuda. *Chem Pharm Bull* 18(2):255-260, 1970.

possibility that the injurious effects of anti-lammatory drugs on the gastric mucosa might be to inhibition of gastric urease (hydrolyzes urea CO_2 and ammonia) was studied in mice. Basic am-ia production (2.5 to 3.5 µg/10g body weight/hr) markedly increased (10 µg/10g/hr) 1 hr after fusion of the stomach with 0.3% urea (urease sub-ate) solution and was completely inhibited after fusion with 0.3% benzohydroxamic acid (inhibitor urease). In the presence of benzohydroxamic acid, a perfusion did not increase ammonia production. ic gastric ammonia production was not affected by tamine-stimulated or atropine-inhibited gastric retion. Three anti-inflammatory drugs (aspirin, nylbutazone and chincophen) displayed weak urease-ibiting activity, *in vitro*, and increased gastric onia production *in vivo* (phenylbutazone was most ent). Ammonia production was markedly increased gastric mucosa kept in contact with eugenol (gas-c mucosa irritant) for 30 min; this effect did not ur in the presence of benzohydroxamic acid. Drugs urious to the gastric mucosa seemingly increase tric ammonia formation by accelerating the enzymic ction between urea and urease.

8 SEQUENTIAL MORPHOLOGICAL CHANGES IN *N*-METHYL-*N*'-NITRO-*N*-NITROSOGUANIDINE CAR-OGENESIS IN THE GLANDULAR STOMACH OF RATS. *(E.)* to, T. (Natl. Cancer Ctr. Res. Inst., Tokyo, an), K. Inokuchi, S. Takayama and T. Sugimura. *at Cancer Inst* 44(4):769-783, 1970.

phological changes were studied in the glandular mach of rats with carcinogenesis induced by *N*-hyl-*N*'-nitro-*N*-nitrosoguanidine which was given 100 rats in their drinking water at the level of µg/ml for 40 weeks and then 84 µg/ml until the of the experiment. Three types of glandular liferation were distinguished: regenerative ndular hyperplasia, adenomatous hyperplasia, and nocarcinoma, all of which occurred mainly in the ral region. After atrophy and erosion of the osa, regenerative glandular hyperplasia, with egular glands at the margins of erosions, devel-d in the 3rd to 5th week, and these lesions per-ted for the rest of the experiment. Adenomatous erplasia, characterized by excessive glandular liferation with scanty cellular atypism, developed the 20th week, and these lesions were found in the ddle of the experimental period. Adenocarcinoma, nsisting of excessive glandular proliferation with llular atypism, appeared in the 30th week and adually invaded to the submucosa, the muscularia opria, and the serosa. After the 60th week, almost l rats had adenocarcinoma with serosal invasion.

9 RELATIONSHIP OF β-GLUCURONIDASE ACTIVITY IN GASTRIC JUICE TO THE HISTOLOGY OF THE STRIC MUCOSA. *(E.)* Russell, R. I. (Roy. Inf., asgow, Scotland), R. MacAllister and R. Campbell. *stroenterology* 58(3):352-357, 1970.

β-glucuronidase activity in the gastric juice was estimated spectrophotometrically in patients with normal gastric mucosa (19), superficial gastritis (5), and with atrophic gastritis (12). Significant differences were found between the specific activities of patients with normal gastric mucosa and those with atrophic gastritis, and between those with normal mucosa and all patients with gastritis. A scattergram of the β-glucuronidase levels in relation to mucosal histology showed that only 1 of the 19 patients with normal histology had an increased β-glucuronidase specific activity, compared with 2 of the 5 patients with superficial gastritis and 10 of 12 patients with atrophic gastritis. The mean value of gastric juice protein in the normal group was 127 mg/100 ml, in the superficial gastritis group, 120 mg/100 ml, and in the atrophic gastritis group, 139 mg/100 ml. There was no significant variation of β-glucuronidase specific activity calculated for each patient as the mean of 4 postalkalinization samples. High β-glucuronidase levels in patients with gastritis possibly may indicate those patients where gastric mucosa may be at risk of undergoing neoplastic change.

4130 THE GASTRIC DISORDER IN IMMUNOGLOBULIN-DEFICIENT PATIENTS. *(E.)* Twomey, J. J. (VA Hosp., Houston, Texas), P. H. Jordan, Jr., A. H. Laughter, H. J. Meuwissen and R. A. Good. *Ann Intern Med* 72(4):499-504, 1970.

The prevalence of gastric structural and secretory abnormalities was studied in 10 patients known to have immunoglobulin deficiency and a propensity for bacterial infections. Immunoglobulin (IgG, IgA and IgM) levels were measured by radial immunodiffusion using rabbit anti-human antisera specific for H-chains, and standard techniques were used to determine serum titers of brucella antibody and of sheep erythrocyte and thyroid hemagglutinating antibodies. All ten patients had reduced levels of IgG (53 to 485 mg/100 ml compared with a normal range of 800 to 1,800 mg/100 ml) and of IgA (0 to 31 mg/100 mg compared to a normal range of 90 to 450 mg/100 ml). IgM was reduced in 8 patients (0 to 21 mg/100 ml) but was within normal ranges (65 to 260 mg/100 ml) in two patients. Sera from four patients contained significant titers of sheep erythrocyte hemagglutinins, all of the 10 immunoglobulin-deficient patients had inflammatory skin reactions to diptheria antigen, but none of the patients had significant titers of circulating brucella antibody. Evidence of a pernicious anemia-like disorder was found in four of the ten immunoglobulin-deficient patients. One patient exhibited gastric acid and intrinsic factor secretory failure, but did not have histological evidence of atrophic gastritis. Parietal cell and intrinsic factor serum antibodies were not detected in any of the 10 immunoglobulin-deficient patients. Immunoglobulin-deficient patients seemingly have an increased prevalence of gastric disease.

4131 INTRADUODENAL CYST CONTAINING BILE AND STONES: "CHOLEDOCHOCELE" IN AN ACCESSORY BILE DUCT: REPORT OF A CASE WITH RECURRENT PANCREATITIS. *(E.)* Jansen, W. (U. Hosp. Groningen, Netherlands). *Gastroenterology* 58(3):397-401, 1970.

An unusual cyst is described in the duodenum of a 15-yr-old girl who presented with symptoms of recurrent obstruction to bile and pancreatic juice flow. Surgical exploration revealed a mass with irregular hard parts in the distal half of the second part of the duodenum and when the duodenum was explored a cyst (3 x 4 cm) covered with mucosa was seen projecting from the posterior wall. The cyst was opened and found to contain a dark green bile and 4 faceted yellow-brown stones. The cyst was lined with intact mucosa, and a probe passed through an opening in its posterior wall touched a probe in the common bile duct at a depth of 2 to 3 cm. The wall of the cyst was cut away, leaving the papilla of Vater and the posterior wall of the cyst with the accessory opening untouched. The postoperative course was uneventful. On pathological examination the specimen of the cyst wall consisted of an outer layer of normal duodenal mucosa, a layer of submucosa with only occassional strands of muscularis mucosae, and an inner lining of mucosa which was indistinguishable from duodenal mucosa. The inner mucosal layer did contain in its lamina propria some lipid-ladden macrophages closely resembling those seen in cholesterolosis of the gallbladder.

4132 PERNICIOUS ANEMIA WITH ATROPHIC GASTRITIS IN A 17 YEAR OLD BOY. *(E.)* Hayes, D. M. (Bowman-Gray Sch. Med., Wake Forest U. Winston-Salem, N.C.), J. F. Martin and T. F. O'Brien. *Southern Med J* 63(4):429-431, 1970.

An unusual case of juvenile pernicious anemia in a 17-year old white male is presented, in which the radiographic examination of the upper gastrointestinal tract revealed evidence of atrophic gastritis. The patient complained of a continuing constipation, exertional dyspnea, fatigability, somnolence and anorexia. The skin was pale and lemon yellow in color, and the tongue was smooth and shiny but not inflamed. The spleen was palpable 2 cm below the left costal margin. Hemaglobin was 8.5 gm/100 ml, hematocrit was 23%, RBC count was 2.1 million, reticulocytes were 3.7%, platelets were 170,000 and WBC count was 3700. In addition to the usual features of Addisonian pernicious anemia (presence of megaloblastic bone marrow, absence of intrinsic factor shown by Schilling test, presence of serum antibodies to parietal cells, and rapid initial increase in reticulocytes, from 1% to 14% in 30 days, in response to vitamin B_{12} therapy), the patient also showed radiographic evidence of atrophic gastritis and achylia gastrica. Vitamin B_{12} therapy (initial dose of 1000 mcg given once weekly for 6 weeks, and a maintenance dose of 100 mcg every 3 weeks) also raised hemoglobin levels from 8 gm/100 ml to 12 gm/100 ml. The patient's subjective complaints disappeared, the spleen became impalpable, and there was a notable increase in weight associated with sexual maturation. Radiologic evaluation of gastric appearance and function may be a useful screening tool for pernicious anemia among young adults.

4133 TUMOR PRODUCTION IN THE GLANDULAR STOMACH AND ALIMENTARY TRACT OF THE RAT BY *N*-METHYL-*N*'-NITRO-*N*-NITROSOGUANADINE. *(E.)* Sugimura, T. (Nat. Cancer Ctr. Res. Inst., Tokyo, Japan), S. Fujimura and T. Baba. *Cancer Res* 30(2):455-465, 1970.

Male Wistar rats given *N*-methyl-*N*'-nitro-*N*-nitrosoguanidine (33-167 μg/ml in the drinking water) were used to study tumor production in the glandul stomach and alimentary tract. After the first 120 days of administration, the body weights began to crease as compared to the controls. No leukopenia was found in the experimental rats up to the 101st day. Most of the tumors were localized in the alimentary tract especially in the glandular stomach, the duodenum and the upper part of the jejunum wit the adjacent mesentery. Tumors were found in the glandular stomach of 14 of 16 rats. They varied i size from miliary plaquelike lesions to fingertip-sized nodules. The tumors were localized in the pylorus or antrum. Most of the tumors in the duodenum adhered to the greater omentum and the neighboring organs and frequently were associated with perforation and obstruction and mesenteric tumors were usually hemorrhagic. All of the tumors of th glandular stomach were either adenomas of adenocarcinomas with only one leiomyoma. Rats examined af 1 yr of experiment showed a variety of other tumor in the duodenum, jejunum, liver and the mesentery. *N*-methyl-*N*'-nitro-*N*-nitrosoguanidine was felt to b tool for facile production of adenocarcinoma in th glandular stomach of rats.

4134 PRIMARY MALIGNANT AND BENIGN TUMORS OF THE DUODENUM: A STUDY OF 18 CASES STRESSING THE CLINICAL AND ROENTGENOGRAPHIC FEATURES. *(E.)* Bruno, M. S. (Lenox Hill Hosp., New York, N. Y.) and H. D. Fein. *Arch Intern Med* 125(4):670-679, 1970.

Case summaries are presented of 18 patients (10 men, 8 women, 38-88-yr-old) with primary tumors (5 benign and 13 malignant) of the duodenum seen at Lenox Hill Hospital from 1950 to 1968. In the group of benign tumors (3 leiomyomas, 1 polypoid adenoma and 1 histiocytoma), bleeding was common and obstruction of the upper-intestinal tract also occurred but was less common. A palpable mass was rarely found and other symptoms were usually secondary to associated diseases. Malignant tumors (10 adenocarcinomas, 1 lymphosarcoma, 1 leimyosarcoma and 1 polypoid adenocarcinoma) almost invariably produced prominent findings; these included obstruction of the intestinal tract, persistent abdominal pain, bleeding, constitutional symptoms and signs of malignancy per se, a palpable abdominal mass and, on occasion, jaundice. Properly executed roentgenographic study and techniques such as hypotonic duodenography and selected abdominal arteriography proved useful in diagnosis.

4135 PRIMARY MALIGNANT TUMORS OF THE DUODENU *(Fr.)* Grosdidier, J. (no affil), R. Par etti, D. Robert and A. Cachard. *Ann Med Nancy* 8(6):401-418, 1969.

4136 GASTRIC ACID CONDITIONS IN PATIENTS WITH GASTRECTOMIES: PRACTICAL SIGNIFICANCE. *(E.)* Depisch, D. (U. Clin. Vienna, Austria), K.

nstl and G. Stacher. *Munchen Med Wschr* 112(13): 3-566, 1970.

37 FIBROMUSCULOSIS IN CHRONIC GASTRITIS. *(E.)* Kubo, T. (Fac. Med. Kyushu U. Fukouka, pan). *Acta Path Jap* 19(3):329-343, 1969.

38 STUDIES ON THE GASTRIC EMPTYING MECHANISM IN HEALTHY PERSONS AND PATIENTS AFTER RTIAL GASTRECTOMY. *(E.)* Berger, T. (Dept. Surg. Goteborg, Sweden). *Acta Chir Scand* (supp. 404): 51, 1969.

39 GASTRIC CANCER: WITH SPECIAL REFERENCE TO THE INDICATION AND TECHNIQUE OF THE TAL GASTRECTOMY. *(E.)* Paulino, F. (no affil). *spital* 77(1):27-34, 1970.

40 RETROGRADE JEJUNOGASTRIC INVAGINATION IN ENTERO-ENTEROANASTOMOSIS: A CASE REPORT. *.)* Vennits, H. W. (Odense City Cty. Hosp., Den- rk) and T. Frederiksen. *Acta Chir Scand* 136(2): 7-160, 1970.

41 TOTAL GASTRECTOMY FOR CARCINOMA OF THE STOMACH. *(E.)* Fox, T. A. Jr., (Henry rd Hosp., Detroit, Mich.). *Henry Ford Hosp Med J* (1):21-26, 1970.

42 RAT GASTRIC SECRETION FOLLOWING ACUTE EXPOSURE TO NICOTINE. *(E.)* Thompson, H. (U. California Los Angeles Sch. Med.) and Bruckner. *Europ J Pharmacol* 9(2):261-263, 1970.

43 CANCER OF THE STOMACH IN UTAH: AN ANALYSIS OF 637 CASES. *(E.)* Dixon, J. A. alt Lake City, Utah), C. R. Smart and V. Moslander. *cky Mount Med J* 67(4):47-50, 1970.

44 PROGNOSIS OF EARLY GASTRIC CANCER. *(E.)* Kasugai, T. (Aichi Cancer Ctr. Hosp., goya, Japan). *Gastroenterology* 58(3):429-431, 70.

45 BIZARRE LEIOMYOMA OF THE STOMACH: CASE REPORT. *(E.)* Xipell, J. M. (Austin Hosp., idelberg, Australia). *Aust New Zeal J Surg* (3):278-280, 1970.

46 HYPERTROPHIC PYLORIC STENOSIS. *(E.)* Ghosh, B. (West Suburban Hosp., Oak rk, Ill.) and J. B. Moles. *J Abdom Surg* 12(4): -58, 1970.

47 GASTRIC TUMOR WITH MULTIPLE NODULES ASSOCIATED WITH LUNG HAMARTOMA IN A GIRL YEARS OF AGE. *(It.)* Vio, A. (Inst. Clin. Surg. Gen. Ther. Surg., U. Bologna, Italy), L. Abate and G. Leogrande. *Ann Ital Chir* 45(4):750-768, 1969.

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4149 THE USE OF XYLAMIDE IN HYPERSECRETION AND METABOLIC ALTERATIONS OF THE GASTRIC MUCOSA. *(It.)* Rovati, A. L. (Rotta Pharmaceuticals, Monza, Milan, Italy) and D. Borellini. *Arch Ital Mal Appar Dig* 36(1-2):60-68, 1969.

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4151 CHRONIC DUODENAL STENOSIS THROUGH AORTO-MESENTERIC BYPASS. *(It.)* Bonacini, G. C. (Civ. Hosp. Sondrio, Italy) and G. Bottinelli. *Ann Radiol Diagn* 42(4):257-268, 1969.

4152 ANATOMIC-FUNCTIONAL STUDIES ON GASTRIC MUCOSA. *(Sp.)* Tomatis, H. P. (Hosp. San Roque, Cordoba, Argentina), M. A. Freytes and A. Piva. *Prensa Med Argent* 56(31):1496-1500, 1969.

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4155 THE VALUE OF THE BILLROTH I METHOD IN GASTRIC RESECTION. *(Ser.)* Kucisec, A. (Army Hosp., Zagreb, Yugoslavia) and S. Kucic. *Lij Vjes* 91(7):709-717, 1969.

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4157 HISTOPATHOLOGY OF CHRONIC GASTRITIS WITH SPECIAL CONSIDERATIONS UPON THE SURGICALLY REMOVED EPITHELIAL CELLS FROM THE STOMACH. *(Jap.)* Kohno, T. (Nihon U. Sch. Med., Japan). *Nihon Univ Med J* 29(1):36-53, 1970.

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4159 TOXIC GASTRITIS, ALCOHOLIC GASTRITIS AND GASTRITIS OF MEDICINAL ORIGIN. (*Fr.*) Bonfils, S. (Hosp. Bichat, Paris, France). *Rev Med* 11(9):475-484, 1970.

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4161 THE REACTIVITY OF THE GASTRIC MUCOSA IN CASE OF A HISTAMINE RESISTENT ANACIDITY. *(Ger.)* Haarman, K. (Fac. Intern. Med., Mannheim, Germany). *Deutsch Med J* 21(4):213-216, 1970.

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4165 AN INTRATHORACIC DUPLICATION OF THE STOMACH. (*Dut.*) Merkelbach, J. W. (Acad. Hosp. Free U. Amsterdam, Netherlands) and H. B. Oey. *Nederl T Geneesk* 114(11):465-468, 1970.

4166 ASSESSMENT AND MANAGEMENT OF HEMORRHAGIC GASTRITIS IN THE RESECTED STOMACH. *(Ger.)* Larena, A. (U. Surg. Clin, Polyclin, Koln-Lindenthal, Germany), K. Fuchs and E. Laufenberg. *Bruns Beitr Klin Chir* 217(7):589-596, 1969.

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4168 THE ACTION OF SOME DIETARY PROTEINS ON GASTRIC SECRETION IN NORMAL AND ULCER SUBJECTS. *(It.)* Melchionda, N. (Dept. Med. U. Bologna, Italy), F. Salteri, F. Pittaluga and F. Benfenati. *Minerva Gastroent* 16(1):9-17, 1970.

4169 GASTRIC LEIOMYOMA. *(It.)* Cirillo, N. (Bari, Italy). *Policlinico* 77(12): 379-389, 1970.

4170 CLINICAL AND RADIOLOGICAL ASPECTS OF COMPENSATION MECHANISMS IN BILLROTH I GASTRORESECTED PATIENTS. *(It.)* Savoldi, E. (Civ. Hosp. Clusone, Italy) and R. Runco. *Minerva Radiol* 14(11):479-483, 1969.

4171 TOMODA JEJUNOPLASTY IN TOTAL GASTRECTOM A REPORT OF 16 CASES. (*Fr.*) Doutre, L. (Bordeaux, France), J. Perrisat, J. C. Beaulieu a J. M. Gouffrant. *Presse Med* 78(17):787-790, 1970

4172 EIGHT CASES OF DUODENAL OCCLUSION DUE T ABNORMAL ROTATION AND FIXATION OF THE INTESTINE. *(It.)* Defant, G. (Surg. Clin. U. Pavi Italy). *Arch Sci Med* 126(8):505-519, 1969.

4173 ON EARLY GASTRIC CANCER IN JAPAN: RELA BETWEEN EARLY GASTRIC CANCER AND ADVANC CANCER. (*Fr.*) Kawai, K. (Med. U. Kyoto, Japan). *Actual Hepatogastroent Hotel Dieu* 5(7):B307-B314, 1969.

4174 VAGOTOMY ASSOCIATED WITH PARTIAL ANTREC TOMY AND GASTRODUODENOSTOMY IN THE LESS CURVATURE: PHYSIOPATHOLOGICAL ASPECTS. (*Por.*) D Silva, A. L. (Fed. U. Minais Gerais, Brazil) and J. R. Da C. Melo. *Rev Ass Med Minais Gerais* 20(3 201-206, 1969.

4175 STUDIES ON POSTOPERATIVE SURVIVAL RATE GASTRIC CANCER. (*Jap.*) Sakamoto, K. (Osaka City U. Med. Sch., Japan). *Jap J Hyg* 24(4 1-6, 1969.

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4177 DRINKING OF ALKALINE MINERAL WATER AND GASTRIC SECRETION. *(Ger.)* Kolesar, J. (Inst. Human Bioclimatol., Bratislava, Czechoslov kia) and J. Dobis. *Arch Phys Ther* 21(5):321-324, 1969.

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4180 THE EFFECT OF ALDOSTERONE UPON GASTRIN INDUCED GASTRIC SECRETION. *(Ger.)* Ottenjann, R. (Med. Clin. Polyclin. U. Erlangen Nuremberg, Germany), P. Deyhle and S. E. Miederer. *Klin Wschr* 48(3): 189-191, 1970.

4181 SECRETORY AND MORPHOLOGICAL ASPECTS OF GASTRIC MUCOSA IN HYPERTHYROIDISM. (*Sp.*) Lopez, J. M. (Hosp. Clin. Catholic U., Chile) and P. Atria. *Rev Med Chile* 97(6):375-381, 1969.

- P:Secr:Stom (3911)
- Diagproc (4026) (4029) (4038) (4042) (4046) (4049) (4067) (4083) (4084) (4090)
- D:Esoph (4113) (4117)
- D:Stomduo:Peptulc (4202)
- D:L.Intest (4264) (4265)
- D:Gen (4594)

STOMACH AND DUODENUM

Peptic Ulcers

4182 CIGARETTE SMOKING AND BODY FORM IN PEPTIC ULCER. *(E.)* Monson, R. R. (Harvard Sch. Publ. Hlth., Boston, Mass.). *Gastroenterology* 58(3):337-344, 1970.

The cigarette smoking histories of physicians with peptic ulcer were determined. Physicians with gastric or duodenal ulcers smoked more than comparable control subjects and started smoking at an earlier age than did control subjects. However, among those physicians with peptic ulcer who smoked cigarettes, patients and control subjects did not differ in the percentage of those who had stopped, the number of years one smoked, or number of packs smoked per day. Body form as measured by height, weight, and ponderal index (height/cube root of weight) was compared between smokers and non-smokers as well as between peptic ulcer patients and control subjects. These comparisons were made for age 21 and for the time of the study in 1968. Physicians with duodenal ulcer were more slender than controls in 1968, but did not differ at age 21 (the reported linearity of persons with duodenal ulcer therefore may be secondary to the ulcer rather than associated directly with a cause of ulcer). Body form of physicians with gastric ulcer did not differ from that of controls. An association between body form and cigarette smoking could not be demonstrated among duodenal ulcer patients; all smokers were more slender than nonsmokers in 1968 but not at age 21.

4183 EFFECT OF SEX HORMONES ON GASTRIC SECRETION AND ON GASTRIC MUCOSA IN OOPHORECTOMIZED HISTAMINE STIMULATED RATS. *(E.)* Kowalewski, K. (Surg. Med. Res. Inst., U. Alberta, Edmonton, Canada), J. F. Schier and G. Chmura. *Digestion* 3(1):13-19, 1970.

Gastric secretory function 24 hr after oophorectomy or after 5 months treatment with testosterone or estrone was studied in female Wistar rats with permanent gastric fistulas and i.v. cannulas. Gastric juice was collected for 24 hr during the infusion of saline or histamine and gastric mucosa. Gastric lesions were present in 14/14 testosterone-treated rats and in 2/14 estrone-treated rats; the ulcer lesions were localized in the glandular mucosa. Necrosis and dense, localized leucocytic infiltration occurred in and around the lesions. Ulcers did not occur in oophorectomized rats, in non-estrogen-treated control rats, or in histamine-treated rats. The output of gastric juice hexosamine was higher in estrone-treated rats than in testosterone-treated rats and control rats. Volume, HCl and pepsin output were not affected by hormone treatment but testosterone enhanced the susceptibility of gastric mucosa to the peptic action of gastric juice.

4184 THE EFFECT OF VAGOTOMY UPON THE SECRETION OF ACID, ELECTROLYTES, PEPSIN AND NITROGEN COMPONENTS. *(Fr.)* Andre, R. (U. Hosp. Brugmann, Free U. Brussels, Belgium) and M. Verhas. *Acta Gastroent Belg* 32(12):877-947, 1969.

Gastric secretion was studied in 65 subjects without symptoms of an esophageal, gastric or duodenal lesion, in 43 patients with duodenal ulcer and in 44 patients who had undergone vagotomy due to a duodenal ulcer. The results of changes in basal, posthistaminic and post-insulin secretions following complete or incomplete vagotomy were compared with experimental studies on dogs under similar conditions of vagotomy plus those following pyroplasty, antrectomy, antrectomy plus vagotomy, and after administration of a vagolytic and a ganglioplegic drug. Hyperchlorhydria was found in the duodenal ulcer patients, and this was maximal in the post-insulin secretion. Complete vagotomy corrected all the secretory abnormalities of the duodenal ulcer patient; it did not induce achlorhydria but it reduced the acid output of basal and post-histaminic secretions, and abolished the secretory response to insulin. Pyroplasty did not reduce either the volume or acidity of gastric secretion.

4185 EFFECTS OF GASTRIC IRRADIATION IN DUODENAL ULCER PATIENTS: GASTRIC SECRETORY RESPONSE TO MAXIMAL HISTAMINE STIMULATION DURING A THREE YEAR PERIOD. *(E.)* Cocco, A. E. (Johns Hopkins U. Sch. Med., Baltimore, Md.) and A. I. Mendeloff. *Johns Hopkins Med J* 126(2):61-68, 1970.

Thirty-three patients (aged 57 to 85 yr) with active duodenal ulcer of long standing and a high gastric acid output in response to maximal histamine stimulation were treated with gastric irradiation, and their courses followed for three yr. Gastric irradiation was performed with cobalt and a total depth dose or stomach dose of 2000 R was given in 8 to 10 treatments. Five of the thirty-three patients had gastric biopsies immediately following gastric irradiation and revealed dark staining nuclei, anisonucleosis, poiklocytosis, and deep staining chromatin in gastric tissues while gastric biopsies done 6 months following irradiation therapy showed normal gastric tissues. Six of the thirty-three patients exhibited normal uptake and excretion of radioactive vitamin B_{12} three yr after irradiation and all thirty-three patients tolerated irradiation well (there were symptoms of vomiting in 6 patients and of nausea in 13 patients). In 94% of the thirty-three patiants, achlorhydria or greater than 50% reduction of acid response to the histamine test was present after 6 months and after three yr, this secretory response was still depressed in three patients. Gastric irradiation at this dose seemingly is a safe and effective method for treating gastric ulcer in poor-risk patients in whom medical management is inadequate.

4186 A DOUBLE-BLIND TRIAL OF CARBENOXOLONE SODIUM CAPSULES IN THE TREATMENT OF DUODENAL ULCER. *(E.)* Cliff, J. M. (Roy. Naval Hosp., Haslar, England) and G. J. Milton-Thompson. *Gut* 11(2):167-170, 1970.

A double-blind controlled trial of orally administered carbenoxolone sodium (Duogastrone) positioned-release capsules versus placebo was carried out on a randomized series of 100 male Service personnel with symptoms of active duodenal ulceration and supporting radiological evidence. The carbenoxolone group received capsules containing 50 mg carbenoxolone four times a day for 12 weeks, while the control group received placebo capsules. Fifty-seven patients completed the trial, 29 in the carbenoxolone group and 28 in the control group. Hematological, biochemical and radiological examinations performed during the study indicated that there was no sign ficant difference in pain scores in response to carbenoxolone. Radiological assessment at the en of six months revealed a slight but clinically in significant improvement in the carbenoxolone grou Thirty-eight patients who did not have an early r mission of symptoms were removed from the trial a placed on capsules known to contain carbenoxolone No significant improvement in status was observed these patients. Side effects due to carbenoxolon therapy included fluid retention, hypertension, potassium loss, heartburn and vomiting.

4187 HEXOSAMINE INTERMEDIATES IN THE HUMAN GASTRIC MUCOSA. *(E.)* Gindzienski, A. (Med. Acad. Bialystock, Poland), K. Zwierz and J. Popowicz. *Biochem Med* 3(5):414-421, 1970.

Ion exchange and paper chromatography were used i the chemical determination and detection of gluco amine intermediates in human gastric mucosa obtai from surgically-resected specimens from patients gastric or duodenal ulcer, or pylorostenosis. Wa eluate in Fraction I of the Dowex column obtained from gastric mucosa contained only N-acetylglucos amine (as shown by color absorption spectrum meth of Reissig). Paper chromatography of the eluate showed a single spot of R_f value identical to N-a tylglucosamine; no sialic acids were found in the eluate. Fraction II contained N-acetylhexosamine 6-phosphate, N-acetylhexosamine 1-phosphate, and acetylneuraminic acid. The hydrolyzed part of Fr tion II had a 15% increase of absorbancy through TCA-extractable acetylated-amino sugars, their ph phate esters and nucleotide derivatives. The rat between N-acetylglucosamine 1-phosphate and N-ace tylglucosamine 6-phosphate was 14 to 86% and all hexosamine intermediates gave a value of 0.125 μM per g of wet tissue (less than 1% of the total am sugars pool).

4188 BRAIN NOREPINEPHRINE AND STOMACH ULCERS RATS EXPOSED TO CHRONIC CONFLICT. *(E.)* Pare, W. P. (VA Hosp., Perry Point, Md.) and A. Livingston, Jr. *Physiol Behavior* 5(2):215-220, 19

The relation between brain norepinephrine levels a stomach ulcers in rats exposed to chronic conflict was studied in three separate experiments. In the first experiment, exposure to shock stress produce a 13-35% decrease in brain norepinephrine levels b did not produce stomach ulcers. Intense shock str for a 2-hr period produced a depletion of brain no inephrine levels. In the second experiment, a hig percentage of ulcers (61%) occurred in rats expose to continuous shock presented on a contingent (to reward) basis than in rats exposed to random shock (positive reward concurrent with negative reinforc ment) and yoked or food control rats. The median number of ulcers per stomach was higher in rats ex posed to contingent shock (4.0) than in rats expos to random shock (2.0) and yoked control (1.5-2.0) food control (1.0) rats. Adrenal weight ratios we lower in contingent (0.1760) and random (0.1665) s

ts than in yoked (0.1958) and food (0.1880) control
ts. Brain norepinephrine levels were higher in con-
ngent and random shock rats and yoked control rats
an in food control rats. Three days of contingent
ock (sufficiently severe to produce stomach ulcers)
d not deplete brain norepinephrine levels. In the
ird experiment, adrenal hypertrophy and 20% deple-
on of whole brain norepinephrine occurred after 2-
exposure to shock in contingent and random shock
ts and in yoked control rats.

189 A COMPARISON OF THE EFFECT OF PENTAGAS-
TRIN AND HISTAMINE ON GASTRIC PEPSIN
ECRETION IN MAN. *(E.)* Aagaard, P. (U. Hosp.,
penhagen, Denmark). *Digestion* 3(1):25-32, 1970.

epsin secretion following a continuous i.v. in-
ution of pentagastrin (0.1 μg/kg/min) and of
istamine (0.7 μg/kg/min) was determined in 20 pa-
ients with duodenal ulcer or gastric ulcer. In
ll cases, stimulation resulted in a considerable
d constant increase in the secretion of pepsin
ove the basal values in output as well as in con-
entration. The total output of pepsin was found
be slightly higher following administration of
istamine than of pentagastrin, but this difference
as not statistically significant. The maximal
alues of output and concentration were obtained
lightly sooner following pentagastrin than hista-
ine, but no other differences were found.

190 MULTIPLE SUTURES IN ULCER PERFORATIONS.
(Ger.) Elias, S. (Balassa Janos Hosp.,
zekszard, Hungary), I. Biro and E. Kelemen Jr.
nchen Med Wschr 112(6):253-255, 1970.

191 THE EFFECT OF ESOPHAGEAL CONSTRICTION
AND LIGATION ON THE RAT WITH A LIGATED
YLORUS. *(Fr.)* Chayvialle, J. A. (Hosp. Edouard
erriott, Lyon, France) and R. Lambert. *C R Soc
iol* 163(6):1400-1402, 1969.

192 MANAGEMENT OF PEPTIC ULCER HEMORRHAGE.
(Por.) De Mendonca, H. T. F. (St. Hosp.
arlos Chagas, Brazil). *Rev Brasil Cir* 58(5-6):332-
34, 1969.

193 XYLAMIDE IN PEPTIC ULCER TREATMENT. *(Por.)*
De Carvalho, P. R. (Dept. Clin. Med., Fed.
. Rio de Janiero, Brazil), J. F. Penteado and N.
acharias. *Rev Brasil Med* 26(10):606-615, 1969.

194 GASTRODUODENAL ULCER SURGERY IN THE AGED.
(Sp.) Perez, J. (Fac. Med. Sci., U.
atl. Cuyo, Mendoza, Argentina), A. A. Marotta,
. A. Donna, J. Cutropia and J. C. Aznar. *Prensa
ed Argent* 56(23):1098-1101, 1970.

195 PEPTIC ULCER. INCIDENCE AND MANAGEMENT
IN OUR REGION. *(Sp.)* Gonzalez Cansino,
. R. (Santiago, Cuba). *Rev Cubana Med* 8(1-2-3):91-
08, 1969.

4196 SELECTION OF TECHNIQUES IN DUODENAL ULCER SURGERY. *(Sp.)* Maurtua, L. C. (Dos de Mayo Hosp., Lima, Peru). *Rev Viernes Med* 20(3):234-250, 1969.

4197 SELECTIVE GASTRIC VAGOTOMY. *(Sp.)* Larrieu, H. (Hosp. Broussais, Paris, France), E. Pelissier and C. Barredo. *Prensa Med Argent* 56(42-43):1845-1848, 1969.

4198 LONG RANGE RESULTS OF SURGICAL AND CONSERVATIVE THERAPY OF PEPTIC ULCER IN MINERS. *(Pol.)* Machalski, M. (Med. Inst. Brzez, Poland) and M. Wilim. *Med Pracy* 20(6):626-632, 1969.

4199 GASTRODUODENAL ULCER IN CHILDREN. *(Rum.)* Goldis, G. (Pediat. Clin. Fundeni, Bucarest, Rumania), N. Ghita, M. Bercovici, R. Gane, V. Bucsa, R. Cohn, E. Marin and E. Mihaescu. *Pediatria* [*Buc*] 18(3):205-214, 1969.

4200 BLEEDING NEONATAL DUODENAL ULCER: SUCCESSFUL SURGICAL TREATMENT OF TWO CASES. *(E.)* Guthorn, P. J. (Fitkin Hosp., Neptune, N. J.), A. P. De Spirito, J. E. Raffetto and U. A. Parkhill. *J Med Soc New Jersey* 67(3):125-127, 1970.

4201 PERFORATED DUODENAL ULCER: LONG-TERM FOLLOW-UP. *(E.)* Nemanich, G. J. (U. Minnesota Hlth. Sci. Ctr., Minneapolis) and D. M. Nicoloff. *Surgery* 67(5):727-734, 1970.

4202 MALIGNANT CHANGE IN CHRONIC GASTRIC ULCER. *(E.)* Sokhi, G. (Roy. Infirm., Glasgow, Scotland). *J Roy Coll Edinb* 15(2):108-111, 1970.

4203 OPERATIVE PROCEDURES USED IN SCANDINAVIA IN 1968 FOR THE TREATMENT OF GASTRODUODENAL ULCER. *(E.)* Viikari, S. (Dept. Surg., U. Turku, Finland). *Ann Chir Gynaec Fenn* 58(3):186-189, 1969-

4204 CLINICAL TRIAL OF SULPIRIDE IN PEPTIC ULCER. *(Fr.)* Girard, M. (Red Cross Hosp., Lyon, France), P. Sambin and Ch. Trepo. *Sem Hop* 46(8):511-516, 1970.

4205 INFLUENCE OF PANCREATIC LIPID ON PATHOGENESIS OF EXPERIMENTAL PEPTIC ULCER. *(E.)* Ikeda, S. (Surg. Clin. Prof. Maruda, Shinshu U., Japan). *Med J Shinshu Univ* 14(1):17-26, 1969.

4206 PRESENT TRENDS IN THE STUDY OF GASTRIC SECRETION IN RELATION TO ULCER SURGERY. *(It.)* Bracco, L. L. (Ivrea Civ. Hosp., Italy) and A. Baldi. *Minerva Chir* 25(2):94-106, 1970.

4207 INSULIN (I. R. I.) SECRETION AFTER TOLBUTAMIDE ADMINISTRATION IN GASTRECTOMIZED PATIENTS. *(It.)* Zandomeneghi, R. (Dept. Med., U. Modena, Italy), R. Piva and A. Menenti. *Minerva Gastroent* 15(4):187-190, 1969.

4208 AN ENZYMETIC INHIBITOR AS A COADJUVANT IN THE POSTSURGICAL THERAPY OF GASTRIC RESECTION FOR DUODENAL ULCER. *(It.)* Casaglia, L. (Magor Hosp., Bologna, Italy), A. Briguglio and G. C. Gianasi. *Minerva Chir* 25(2):107-111, 1970.

4209 STUDY ON THE ADAPTABILITY OF SURGICAL TREATMENT FOR GASTRIC ULCER BY STATISTICAL ANALYSIS AND COMPUTER ANALYSIS WITH DISCRIMINANT FUNCTION. (*Jap.*) Hattori, H. (Sch. Med. Showa U., Japan). *J Showa Med Ass* 29(11):19-38, 1969.

4210 THE MANAGEMENT OF GASTRIC AND DUODENAL ULCER COMPLICATIONS: CONDITION FOLLOWING STOMACH RESECTION. *(Ger.)* Schultis, K. (Med. Clin. Polyclin, Justus Liebig U., Giessen, Germany). *Med Welt* 21(8):291-293, 1970.

4211 PEPTIC ULCER IN PREGNANCY. (*Gr.*) Kairis, N. M. (no affil) and M. G. Papapostolou. *Hellenike Iatrike* 38(12):1343-1349, 1969.

4212 NOCTURNAL INTUBATION AND GASTRIC ACIDITY TESTS IN THE SURGICAL MANAGEMENT OF DUODENAL ULCER. *(Fr.)* Henrion, C. (Bousso, Belgium) and P. Mainguet. *Acta Chir Belg* 68(6):445-458, 1969.

4213 EXPERIENCE WITH 38 GASTRODUODENAL MASSIVE HEMORRHAGES: 23 EMERGENCY OPERATIONS. *(Fr.)* Kuhlmann, N. (C. H. U. Oran, Algeria), F. Lopez-Rodriguez, M. Billieres and F. Renaud. *Strasbourg Med* 20(8):748-755, 1969.

4214 THE BILLROTH II - FINSTERER RESECTION FOR GASTRODUODENAL ULCER: LONG-TERM RESULTS. *(Ger.)* Dimakakos, P. B. (Canton Hosp. Winterthur, Switzerland). *Helvetia Chir Acta* 36(6):582-593, 1969.

4215 GASTRIC ACIDITY DETERMINATIONS ON EXPERIMENTAL ANIMALS. *(Ger.)* Kugler, S. (Surg. U. Clin. Hamburg, Germany). *Aertzel Forsch* 24(3): 75-81, 1970.

- P:Gen (4003)
- Diagproc (4080) (4090)
- D:Esoph (4124)
- D:Stomduo (4137) (4174)
- D:L.Intest (4264)
- D:Livbil:A.Nonv.Hep (4459)

SMALL INTESTINE

4216 INTESTINAL MUCOSA IN CHILDREN WITH GEOPHAGIA AND IRON-DEFICIENCY ANEMIA. *(E.)* Berkel, I. (Hacettepe U. Fac. Med., Ankara, Turkey), B. Say and O. Kiran. *Scand J Haemat* 7(1):18-25, 1970.

Gastrointestinal function was studied by d-xylose absorption, glucose tolerance tests and oral intestinal biopsy in 7 male and 14 female geophagic patients (between the ages of 3-1/2 and 16) suffering from iron-deficiency anemia. Hematological studies indicated bone marrow with normoblastic erythroid hyperplasia and low serum iron. Five patients were found to have ascaris ova in the stool, and 5 also had traces of occult bleeding. Glucose tolerance curves were flat in 2 of the 9 subjects tested, and d-xylose absorption was abnormal in only one of the 6 patients tested. The jejunal biopsies of 13 patients showed focal changes in the mucosa characterized by broader and shorter villi with a tendenc to branch; areas of cuboidal cells with some degree of atrophy; increased depth of crypts; increased cellular infiltration and edema of the lamina propria. No correlation was found between the severit of anemia and the mucosal change, and the histories revealed no association between the duration of anemia and/or geophagia and histological alteration d-Xylose absorption and glucose tolerance tests showed no correlation to biopsy findings, with the exception of one patient. Oral iron treatment and normal diet corrected both the anemia and the abnormal mucosal histology, suggesting that the jejun mucosal changes in these patients were the end resu of iron deficiency.

17 JEJUNAL HEMATOMA, CHILD ABUSE, AND FELSON'S SIGN. *(E.)* Bratu, M. (Hosp. St. phael, New Haven, Conn.), J. C. Dower, B. Siegel d S. H. Hosney. *Connecticut Med* 34(4):261-264, 70.

18 PARADUODENAL HERNIA. *(E.)* Naqvi, M. A. (New Waterford, Nova Scotia, Canada), S. Nathanson, J. A. Roach and W. J. Payne. *Nova otia Med Bull* 49(2):37-39, 1970.

19 JEJUNAL INTUSSUSCEPTION: A COMPLICATION OF SMALL BOWEL BYPASS FOR INTRACTABLE ESITY. *(E.)* Tanga, M. R. (Ottawa Gen. Hosp., tario, Canada), W. G. Waddell and J. L. Wellington. *nad J Surg* 13(2):168-169, 1970.

20 SARCOMAS OF MECKEL'S DIVERTICULUM. *(E.)* Chatterjee, C. R. (U. Alberta Hosp., monton, Canada). *Canad J Surg* 13(2):163-165, 70.

21 UNUSUAL PROBLEMS IN SURGERY: CONGENITAL JEJUNAL DIAPHRAGM IN A PREMATURE INFANT. *.)* Beck, A. R. (Mt. Sinai Hosp., New York, N.Y.) d J. J. Leichtling. *Mount Sinai J Med* 37(2): 9-145, 1970.

22 DIVERTICULOSIS OF THE SMALL INTESTINE AND MEGALOBLASTIC ANEMIA: PATHOGENESIS. *.)* Schjonsby, H. (U. Bergen Sch. Med., Norway). *ta Med Scand* 187(1-2):3-5, 1970.

23 THE CARCINOID SYNDROME: AN EXAMPLE DUE TO AN ILEAL POLYP. *(E.)* Orr, K. B. (St. orge Hosp., Sydney, Australia). *Aust New Zeal Surg* 39(3):268-272, 1970.

24 MALIGNANT GRANULOMA OF THE SMALL INTESTINE. *(It.)* Martelli, C. F. (Hosp. Mare-Lido, enice, Italy). *Pathologica* 61(893-894):61-72, 1969.

25 DISORDERS FOLLOWING ILEOSTOMY. *(It.)* Algani, G. (Dept. Anat. Surg., U. Trieste, aly). *Minerva Med Giuliana* 9(4):176-178, 1969.

26 ETIOLOGY AND PATHOGENESIS OF AN ILEAL ENTEROLITH IN MECKEL'S DIVERTICULUM. *(It.)* riccoli, A. (Inst. Clin. Gen. Surg., Surg. Ther., Bologna, Italy). *Rass Int Clin Ter* 49(23): 59-1463, 1969.

27 THE X-RAY PICTURE OF LYMPHOSARCOMA OF THE SMALL INTESTINE. *(Ser.)* Mihajlovic, N. en. Hosp., Zagreb, Yugoslavia). *Lij Vjes* 91(7): 3-740, 1969.

4228 AN EXTENSIVE RESECTION OF THE SMALL BOWEL IN CHILDREN. *(Cz.)* Pohl, V. (Med. Fac., U. Komenskeho, Bratislava, Czechoslovakia), M. Mordia and M. Macek. *Bratisl Lek Listy* 52(4):443-449, 1969.

4229 LYMPHOSARCOMA OF THE SMALL BOWEL IN A CHILD. *(Cz.)* Tosovsky, V. (Clin. Child Surg. Prague, Czechoslovakia), J. Houbova and K. Kubat. *Bratisl Lek Listy* 52(4):469-474, 1969.

4230 INTESTINAL MALFORMATION: ATRESIA OF THE SMALL INTESTINE. REPORT OF 3 OBSERVATIONS. *(Sp.)* Rosa, F. (no affil). *Arch Pediat Uruguay* 40(6):475-477, 1969.

4231 NUTRITION IN CASE OF INTESTINAL RESECTION IN THE NEWBORN. *(Sp.)* Birenbaum, M. (Dr. Luis Morguio Pediat. Clin., Montevideo, Uruguay). *Arch Pediat Uruguay* 40(6):451-456, 1969.

4232 DIFFUSE JEJUNO-ILEITIS IN THE GENESIS OF CAPSULATED PERITONITIS: EVOLUTIVE, RADIOGRAPHIC AND HISTOLOGICAL RECORDS. *(Fr.)* Albot, G. (Paris, France), M. Parturier-Albot, R. Rettori, J. P. Camilleri, S. Veyne and J. Christofle. *Ann Gastroent Hepatol* 6(1):1-17, 1970.

4233 RETICULUM-CELL SARCOMA OF THE SMALL BOWEL REVEALED BY A MALABSORPTION SYNDROME. *(Fr.)* Dhumeaux, D. (Hosp. St. Antoine, Paris, France), P. M. Huet, J. Eteve, A. Grynblat and J. Caroli. *Sem Hop* 46(8):493-500, 1970.

4234 A RARE CAUSE OF INTESTINAL OCCLUSION: INTERNAL CONSTRICTION THROUGH THE GREATER OMENTUM. *(Fr.)* Kuhlmann, N. (C. H. U. Oran, Algeria) and Kazdali. *Strasbourg Med* 20(8):756-759, 1969.

4235 A PECULIAR COMPLICATION OF MECKEL'S DIVERTICULUM. *(Ger.)* Laube, J. (Annaberg Hosp., Germany) and G. Seidel. *Zbl Chir* 94(51):1748-1749, 1969.

4236 RETICULOSARCOMA OF THE MESENTERY OF THE SMALL INTESTINE. *(It.)* Galli, R. (Inst. Surg. Symptomatol., U. Bologna, Italy) and G. Donati. *Osp Ital Chir* 21(2):121-133, 1969.

4237 TERMINAL ILEITIS: CLINICAL STUDY. *(It.)* Ciccolini, A. (Maria Vittoria Hosp., Turin, Italy). *Minerva Chir* 25(1):30-37, 1970.

4238 OCCLUSION DUE TO MULTIPLE ATRESIA OF THE SMALL INTESTINE IN THE NEWBORN. *(It.)* Di Lorenzo, G. D. (Barone Paolo Agliata Civ. Hosp., Petralia Sottana, Palermo, Italy), M. Montalbamo and C. Buccellato. *Minerva Chir* 25(1):38-47, 1970.

4239 DUPLICATION OF THE TERMINAL ILEUM. *(It.)* Mensi, E. (Koelliker Hosp., Turin, Italy). *Minerva Nipiol* 18(supp. 6):226-231, 1969.

4240 CHOLORRHEA FOLLOWING ILEUM RESECTION: CHOLESTYRAMINE THERAPY. *(Ger.)* Bahls, G. (no affil). *Z Gstroent* 8(1):41-43, 1970.

4241 A CASE OF PEUTZ-JEGHERS SYNDROME. *(It.)* Di Carlo, V. (Gen. Emerg. Surg. Dept., U. Milan, Italy), A. Martinotti and G. Bevilacqua. *Minerva Chir* 25(2):112-120, 1970.

- P:Morph (3820)
- Diagproc (4051) (4052) (4084)
- D:Stomduo (4140) (4172)
- D:Gen (4565) (4566) (4641)

SMALL INTESTINE

Regional Enteritis

4242 DIAGNOSIS OF CROHN'S DISEASE: A CONTINUING SOURCE OF ERROR. *(E.)* Dyer, N. H. (St. Bartholomew Hosp., London, England) and A. M. Dawson. *Brit Med J* 1(5698):735-737, 1970.

An analysis was made of the hospital records of 161 patients seen during the period 1955 to 1967 with clinical, radiological, and/or pathological features of Crohn's disease. There was a great variation in the duration of symptoms before the diagnosis of Crohn's disease was established, the mean delay being 4.3 yr and particularly common in children and adolescents. Pain and diarrhea were the most frequent symptoms (87% and 66% of the patients, resp.) and also the most dominant symptoms (37% and 30% resp.). The only other dominant symptom was acute abdomen (19%). Only 6% of the patients were correctly diagnosed after the initial series of investigations and the disease was commonly misdiagnosed as a colonic lesion, appendicitis, or functional bowel disturbance, and in 9% a firm diagnosis could not be made. The main reason for the false diagnosis of Crohn's disease was inadequate or inconclusive radiography such as the failure to perform a barium follow-through examination when both the barium-meal and barium-enema radiographs were normal. Vague inflammatory changes were noted in the ileum in 5 patients, dilatation of the ileum in 2, and a malabsorption pattern was present in 2 other patients. Five patients had ulcerative colitis and 4 had ischemic colitis.

4243 AN ATTEMPT AT IMMUNOLOGICAL TREATMENT IN CROHN'S DISEASE: PRELIMINARY NOTE. *(Fr.* Geffroy, Y. (C.H.U. Rouen, France), R. Colin and P. Charvet. *Arch Franc Mal Appar Dig* 59(3):157-162, 1970.

4244 THE ETIOLOGY OF ACUTE REGIONAL ENTERITIS (ILEITIS). *(Ger.)* Knapp, W. (Inst. Hyg. Med. Microbiol., U. Erlangen Nurenberg, Germany), H. Fahrlander and H. Hartweg. *Schweiz Med Wschr* 100(8):364-368, 1970.

4245 INCIPIENT ILEO-VESICAL FISTULA AS THE FI SYMPTOM OF CROHN'S DISEASE. *(Dut.)* Lubbers, E. J. C. (St. Radboud Hosp., Nijmegen, Net-erlands). *Nederl T Geneesk* 114(13):547-549, 1970.

4246 THE RELATIONSHIP OF CROHN'S DISEASE TO SARCOIDOSIS. *(E.)* Dyer, N. H. (St. Bartholomew's Hosp., London, England) and J. M. T. Willoughby. *Saint Bartholomew Hosp J* 77(4):128-130 1970.

- D:S.Intest (4225)
- D:L.Intest (4281)

Malabsorption

247 EOSINOPHILIC GASTROENTERITIS: REPORT OF A CASE WITH MALABSORPTION AND PROTEIN-LOSING NTEROPATHY. *(E.)* Kowlessar, O. D. (Jefferson Med. oll., Philadelphia, Pa.), F. Goldstein and S. M. aplan. *Gastroenterology* 58(4):540-545, 1970.

he case of a 77-year-old woman with eosinophilic gasroenteritis of long duration is presented. On first dmission the abdomen was markedly distended and gurling peristaltic sounds were heard. Laboratory studes indicated a low hemoglobin concentration (7.1 g/00 ml) normal serum electrolytes except for refracory hypokalemia (3.5 mEq/liter), hypocalcemia (3.1 Eq/liter), and hypophosphatemia (1.8 mg/100 ml), and evere malabsorption (stool fat excretion: 47 /day). The patient had a severe normocytic, norochromic anemia; serum iron, total iron-binding caacity, folate, haptoglobin, and vitamin B_{12} levels ere normal. The bone marrow showed eosinophilic hyerplasia representing 30% of the total cells, noroblastic erythropoiesis, and stainable iron. A small owel biopsy revealed edema, hemorrhage, and infiltraion with predominantly plasma cells and eosinophils n the lamina propria. A daily dose of 20 mg of predisone caused marked clinical improvement, and her ecal fat excretion on a 100 g daily fat intake dereased from 47 to 4.5 g daily. On second admission, months later, hemoglobin concentration was normal 13.1 g/100 ml) and fat absorption was near normal 6.1 g/24 hr; < 5 g/24 hr is normal). Radiographs howed an atrophic mucosal pattern in the stomach, and early total absence of the normal mucosal folds in he proximal small bowel. The small bowel biopsy reained essentially unchanged, and treatment was coninued with prednisone, 10 mg daily. Three months ater she was readmitted to hospital (for the third ime) after 1 week of abdominal distension and ankle dema. Physical examination showed moderate abdomial distension, occasional gurgling peristaltic sounds, nd moderate ankle and pretibial edema. Further inrease in hematological and chemical parameters were oted and the dose of prednisone increased to 15 mg aily and then changed to 30 mg every other day with a ubsequent decrease in bowel frequency and less abdomnal distension. A small bowel biopsy and radiographic eries showed no change. The patient was discharged aking 30 mg of prednisone every other day, oral calium and potassium supplements, vitamins, and a modertely salt-restricted diet.

248 USE OF ^{3}H-LABELED TRIETHER, A NONABSORBABLE OIL-PHASE MARKER, TO ESTIMATE FAT ABSORPION IN RATS WITH CHOLESTYRAMINE-INDUCED STEATORRHEA. *E.)* Morgan, R. G. H. (Dept. Physiol., U. Western ustralia, Nedlands) and A. F. Hofmann. *J Lipid Res* 1(3):231-236, 1970.

fter unlabeled diets containing 0, 2, 4, and 6% holestyramine had been fed for 14 days to Sprague-awley Mayo Clinic rats to induce steatorrhea (each iet fed to 4 animals), the diets were replaced by a test meal containing ^{14}C-labeled trilinolein and ^{3}H-labeled triether. Fat absorption was estimated y isotope ratios (the change in ^{3}H/^{14}C in the test eal and in feces); by isotope recovery (the total ecal excretion of ^{14}C radioactivity); and by chemical recovery (total fecal fat excretion). Cholestyramine decreased the fat absorption proportionally with all dose levels. Absorption calculated from isotope ratios agreed well with that calculated from isotope recovery over a range of fat absorption of 50 to 100% thus validating the use of this nonabsorbable oil-phase marker (^{3}H-labeled triether) under these conditions of fat malabsorption. Fat absorption measured by chemical recovery was strikingly lower than that calculated from isotope ratios or isotope recovery, suggesting that cholestyramine increased the excretion of nondietary (endogenous) fat. Triether may be of value for studying the absorption of compounds present predominantly in the oil phase during digestion and may have significant advantages over other proposed lipid markers.

4249 THE SUBTLE AND VARIABLE CLINICAL EXPRESSIONS OF GLUTEN-INDUCED ENTEROPATHY (ADULT CELIAC DISEASE, NONTROPICAL SPRUE): AN ANALYSIS OF TWENTY-ONE CONSECUTIVE CASES. *(E.)* Mann, J. G. (U. Colorado Med. Ctr., Denver), W. R. Brown and F. Kern, Jr. *Amer J Med* 48(3):357-366, 1970.

The clinical features of gluten-induced enteropathy were studied in 10 male and 11 female patients (age 21 to 79). The classic features of diarrhea, weight loss, steatorrhea and malnutrition were the predominant features in only 8/21 (38%) patients. Included in the 21 patients were 3 patients with diabetes with diarrhea and 3 with postoperative diarrhea, 4 with mild and nonspecific gastrointestinal complaints, and 3 with selected nutritional deficiencies. In the entire group of 21 patients, 48% showed weight loss, 29% edema, 29% abdominal pain, and 10% tetany; with other problems including thrombophlebitis, megaloblastic anemia of pregnancy, nonspecific gastrointestinal symptoms and bone pain. Laboratory abnormalities were often minimal or mild; steatorrhea was present in only 65%, intestinal disaccharidase activities were low in 12 untreated patients. The mean serum immunoglobulin M (IgM) level was significantly diminished in 12 of the 21 patients studied, and 1 patient had a selected serum and exocrine IgA deficiency. In 3 patients, a roentgenographic malabsorption pattern was the initial clue to the diagnosis. The clinical expressions of gluten-induced enteropathy are highly variable and may be subtle or occult.

4250 MASTOCYTOSIS AND INTESTINAL MALABSORPTION. *(E.)* Broitman, S. A. (Boston City Hosp., Massachusetts), R. S. McCray, J. C. May, J. J. Deren, F. Ackroyd, L. S. Gottlieb, W. McDermott and N. Zamcheck. *Amer J Med* 48(3):382-389, 1970.

Malabsorption of carbohydrates, fat and vitamin B_{12} with extensive and diffuse entire small bowel involvement accompanied systemic mastocytosis in a 61 yr old white woman. Abnormal numbers of mast cells beneath the muscularis were found by surgical small bowel biopsy and in the lamina propria and submucosa by rectal biopsy. Peroral small bowel biopsy showed intense mucosal and submucosal round cell infiltrates containing large numbers of eosinophils. High titers of antibodies to gluten (fraction III), alpha lactalbumin and beta lactoglobulin indicated transmucosal passage of incompletely degraded food antigens. Sensitivity to gluten was demonstrated by a favorable response to a gluten-free diet, and prompt exacerbation of steatorrhea and diarrhea following gluten challenge and this was considered to be secondary to mast cell invasion of the gastrointestinal tract rather than adult celiac disease unmasked by systemic mastocytosis. On a daily fat intake of 100 g incorporated into a gluten-containing diet, the attacks of facial flushing, abdominal pain, tachycardia and explosive diarrhea ceased and were coincident with a decrease in serum magnesium (restoration of magnesium levels to normal was followed by a recurrence of attacks). Of particular interest in this patient was the presence of the entire mastocytosis symptom complex without evidence of histaminuria. Histidine loading produced neither symptoms nor the pronounced histaminuria noted in other patients with mast cell disease.

4251 IRON METABOLISM AND ABOSRPTION STUDIES IN THE X-LINKED ANEMIA OF MICE. *(E.)* Pinkerton, P. H. (Sunnybrook Hosp., Toronto, Ontario, Canada), R. M. Bannerman, T. D. Doeblin, B. M. Benisch and J. A. Edwards. *Brit J Haemat* 18(2): 211-228, 1970.

Radioisotope techniques, intestinal transit rate determinations, and chemical determinations of iron- and heme-containing enzymes were used to study the X-linked anemia (inherited as a recessive trait) of mice. In these mice, stainable irons stores were reduced, and the anemia was shown to be hypochromic and microcytic. Chemical estimates of total body iron and serum iron concentration revealed low values and the total iron binding capacity was increased in anemic mice. Rapid plasma iron clearance and increased iron utilization provided further confirmation of iron deficiency in anemic animals. Decreased activity of heme-containing enzymes was found only in kidney cytochrome oxidase. The blood volume of mice with X-linked anemia was increased in spite of decreased red cell mass. The anemic mice had impaired intestinal iron absorption but there was no evidence of impaired retention of orally administered radioiodinated triolein, radio-zinc, radio-copper and radio-cobalt. The genetically-determined defect in the intestinal mucosa of mice with X-linked anemia may be due to deficiency of either an enzyme or a carrier substance for the normal transfer of iron from the intestinal mucosal cell to the plasma.

4252 THE INTESTINAL FLORA IN THE CLINICAL ASSESSMENT OF STEATORRHEA. *(It.)* Ferri, S. (Inst. Gen. Med. Clin., Med. Ther., U. Bologna, Italy) and L. Sammarro. *Arch Ital Mal Appar Dig* 36(1-2):69-86, 1969.

4253 DIAGNOSTIC PROBLEMS IN GLUCOSE-GALACTOSE MALABSORPTION. *(E.)* Kaijser, K. (Central County Hosp., Eskilstuna, Sweden) and P. A. Ockerman. *Acta Paediat Scand* 59(2):214-216, 1970.

4254 SPRUE BY ANY OTHER NAME. *(E.)* Rubin, C. E. (U. Washington Sch. Med., Seattl S. Eidelman and W. M. Weinstein. *Gastroenterolo* 58(3):409-411, 1970.

4255 MALABSORPTION SYNDROME. (*Dut.*) Verhae H. (St. Bartholomew Hosp., Merksem, Net erlands), A. De Beukelaar, F. Krug and P. Devos. *Gastroent* 12(6):535-548, 1969.

4256 CELIAC DISEASE. *(Fr.)* Lascombes, G. affil). *Med Infant* 76(10):799-804, 19

4257 MALABSORPTION AND MALIGNANCIES. (*Fr.*) Caroli, J. (Hosp. St. Antoine, Paris, France), I. Bocquet, P. Huet and D. Dhumeaux. *R* *Medicochir Mal Foie* 45(2):119-126, 1970.

4258 CONGENITAL GLUCOSE AND GALACTOSE MALAB-SORPTION. *(It.)* De Bernardi, B. (Pedi Clin. U. Padua, Italy) and E. Agosti. *Acta Paed* *Lat* 22(5):587-601, 1969.

4259 HEREDITARY FRUCTOSE INTOLERANCE. *(Fr.)* Debry, G. (no affil), J. Laurent, P. Cherrier, D. Guisard and J. P. Ganand. *Ann Med Nancy* 8(11):677-680, 1969.

4260 VITAMIN B-12 ABSORPTION DISORDERS FOLL ING BIGUANIDE THERAPY. *(Ger.)* Keiser, (Dist. Hosp. Zug, Switzerland), P. Berchtold, P. Bolli and U. Arbenz. *Schweiz Med Wschr* 100(7): 351-353, 1970.

4261 PROTEIN-LOSING GASTROENTEROPATHY RESPON TO CORTICOSTEROID TREATMENT. (*E.*) Lebenthal, E. (Tel Aviv U. Med. Sch., Petah Tikva Israel), M. Gaifman and M. Nitzan. *Acta Paediat* *Scand* 59(2):217-220, 1970.

4262 PATHOPHYSIOLOGY OF SPRUE SYNDROMES. (*E.* Weser, E. (U. Texas Sch. Med. San Anton and M. H. Slesinger. *Adv Intern Med* 15:253-265, 1969.

- P:Absorp (3866) (3876)
- D:S.Intest (4233)
- D:Pancreas:Pancreat (4350)
- D:Gen (4636) (4637) (4647)

263 A SYSTEMATIC SEX DIFFERENCE IN INTESTINAL CARCINOMA. *(E.)* Ashley, D. J. B. (Morris- on Hosp., Swansea, Wales). *Cancer* 25(4):966-971, 970.

he age- and sex-specific mortality rates for cancer f the colon and rectum were analyzed for populations n England and Wales and in the United States. Over- ll, there was a greater number of deaths from rectal ancer in men than in women but the number of deaths rom colonic cancer was approximately equal in both exes. In the case of each tumor and in either sex, he age-specific incidence rates fell on a straight ine when plotted in a double logarithmic form, but, n the case of each tumor, the line for men was teeper than that for women. On the hypothesis of rmitage and Doll that multiple hits are necessary for ncogenosis it appeared that the number of hits re- uired in the male was one greater than that in the emale. The suggestion that the additional hit might nvolve the Y chromosome was examined and considered nlikely and a second alternative, that the population omprises 2 components, one liable to develop intes- inal cancer after r hits and the other requiring r + 1 hits, and that the proportions requiring the maller number of hits differed in the 2 sexes was xamined and was considered feasible. The difference in susceptibility to cancer of the rectum and colon seemingly is due to the action of dominant genes on the X chromosome.

4264 FACTORS CONTROLLING COLONIC MOTILITY: COLONIC PRESSURES AND TRANSIT AFTER MEALS IN PATIENTS WITH TOTAL GASTRECTOMY, PERNICIOUS ANEMIA OR DUODENAL ULCER. *(E.)* Holdstock, D. J. (Central Middlesex Hosp., London, England) and J. J. Misiewicz. *Gut* 11(2):100-110, 1970.

Colonic intraluminal pressures and motility were measured in 3 groups of patients (pernicious anemia, duodenal ulcer, total gastrectomy) before and after a standard meal. Colonic pressure activity increased during and after food in all patients, but this was only once associated with propulsive activity. The increase in motor activity which began during the meal continued throughout the postprandial half-hour. One or both variables (pressure and propulsion) of motility were significantly higher than basal values at the proximal colon, the sigmoid and the rectum in all 3 groups of patients. Comparisons of activity during the postprandial half-hour between the three groups showed a similar response of the proximal colon and rectum, but some aspects of sigmoid activity in the total gastrectomy group differed from that in the other 2 patients. There was a significantly greater sigmoid response in the total gastrectomy patients than in the others, while there were no significant differences between the other 2 groups. The entry of food into the upper small intestine seemingly is the most important factor in initiating the colonic pressure response to food, since this response apparently does not require the presence of the stomach, acid, antral gastrin, or of vagal innervation.

4265 INCIDENCE AND MORTALITY OF INTESTINAL CANCER. *(E.)* Ashley, D. J. B. (Morriston Hosp., Swansea, Wales). *Cancer* 25(4):959-965, 1970.

Analyses of the age-specific rates for the incidence of and mortality from cancer of the colon and rectum showed that there was a general agreement with the multihit theory of carcinogenesis but that the number of hits which must be postulated is greater by one in the case of mortality than in the case of incidence. This additional change confers the property of aggressiveness on the tumor and if it occurs during the course of carcinogenesis, the neoplasm when it first grows is already endowed with a high propensity for spread and a correspondingly poor prognosis. On the other hand, this change may occur as an event in the progression of an established tumor in which case early surgical extirpation may result in cure. In the case of gastric and pancreatic carcinoma, the number of hits required for the observed incidence and mortality curves are the same, and it is suggested that the aggressiveness change is essential in the development of cancer in the gastric mucosal cells.

4266 HIRSCHPRUNG'S DISEASE IN A PREMATURE INFANT. *(E.)* Gelband, H. (Mt. Sinai Sch. Med., City U., New York, N. Y.), R. J. Bonforte and I. Krasna. *Mount Sinai J Med* 37(2):112-114, 1970.

A case report is presented of a premature female infant who manifested abdominal symptomatology in the neonatal period. Distention noted at 2 days of age subsided after the passage of meconium and at 8 days of age, a plain abdominal x-ray film showed distended loops of small intestine, without distention of the large bowel. Penicillin and neomycin treatment, i.v. fluid therapy, passage of a Levin tube and an enema eliminated the distention by 24 hr and at 11 days of age, the baby was passing normal stools, and at 6 weeks, after a barium examination proved to be normal, she was discharged. At 8 weeks of age she was readmitted with vomiting, diarrhea, and abdominal distention and a barium enema showed narrowing of the distal segment of the rectum and a dilated large bowel proximal to the stenotic area. A tentative diagnosis of Hirschsprung's disease was made, and a transverse colostomy was performed and biopsy specimens from the colostomy site showed many ganglion cells. The postoperative course was complicated by gastroenteritis which responded to i.v. hydration and oral polymyxin. At 3 months of age, the baby was discharged. The patient did well and at 2 yr of age she was readmitted for definitive surgical correction of her colonic lesion. A Duhamel procedure was subsequently performed. Pathological specimens showed aganglionosis extending to the midsigmoid colon.

4267 A STUDY OF ABNORMAL MUSCULAR PATTERNS IN DIVERTICULAR DISEASE OF THE COLON USING THE POLYSILOXANE FOAM ENEMA. *(E.)* Hughes, L. E. (Roy. Brisbane Hosp., Australia). *Gut* 11(2): 111-117, 1970.

Three types of impressions due to muscular contractions found in the region of the rectum and sigmoid were demonstrated in three-dimensional, functional studies of the left colon in 46 patients with diverticulosis using a polysiloxane foam enema; two of these impressions were due to the presence of diverticular disease. The Type I muscle abnormality consisted of deep impressions due to muscular bands alternating from side to side and diverticula were frequently seen arising from the apex of the ridges between the bands. The Type II muscle abnormality consisted of a series of sigmoid curves, usually 4 or 5 alternating convexities and concavities. This change was sometimes present as an isolated finding, but it also occurred below an area of Type I change. The Type III change consisted of 2 or 3 deep muscular contractions close together, but different from Type II muscle change in that the bands were on the same side of the bowel, instead of alternating from side to side. The change was much more localized than Type II. The Type III abnormality might be associated with sphincteric action at the recto-sigmoid junction. Reproducibility of findings on repeated examinations indicated that there was a local anatomical basis for the muscular impressions seen and that such contractions did not represent evanescent peristaltic type activity.

4268 RECTAL AND COLONIC STUDIES AFTER RESECTION OF THE SIGMOID FOR DIVERTICULAR DISEASE. *(E.)* Parks, T. G. (St. Marks Hosp., London, England). *Gut* 11(2):121-125, 1970.

Investigations were carried out on 23 patients in whom segments of the sigmoid bearing diverticula had been excised and the bowel anastomosed at least 6 months previously. In one series consisting of 9 patients, colonic pressures were measured at basal conditions, 30 min after eating and 30 min after i.m. injection of 0.5 mg of prostigmine and in a second series consisting of 14 patients the colonic response to stretching was measured. Spontaneous basal rectal activity was more than twice the normal. The rectum of post-resection cases yielded a markedly exaggerated overall response to prostigmine, in addition to producing abundant fast wave patterns. The response to stretch of the apparently normal colonic muscle remaining after resection resembled unresected diverticular segments, though less in degree, suggesting that a fundamental disorder of the colonic muscle may be involved in the etiology of colonic diverticula.

4269 ANORECTAL (INTRA- AND EXTRAPERITONEAL) INJURIES. *(Sp.)* Lembrande, R. O. (Rawson Sala Hosp., Buenos Aires, Argentina). *Prensa Med Argent* 56(34):1652-1656, 1969.

4270 RECTOCOLIC CAUSES OF INFECTED PERITONEUM IN THE AGED. *(Sp.)* Aloise, P. R. (no affil), A. N. Candioti, B. P. Ceriani and J. Christie. *Prensa Med Argent* 56(23):1091-1093, 1969.

4271 COLONIC, RECTAL AND ANAL CANCER: CLINIC CONSIDERATIONS AT THE NAVY MEDICAL CENTE *(Sp.)* Aguilar Fajardo, P. (Naval Med. Ctr., Peru) *Rev Sanid Naval Peru* 5(1):37-46, 1969.

4272 SURGICAL MANAGEMENT OF COLON, RECTUM AND ANAL CANCER AT THE NAVY MEDICAL CENTER. (1959-1969). *(Sp.)* Meza Segura, J. (Naval Med. Ctr., Peru). *Rev Sanid Naval Peru* 5(1):47-57, 196

4273 COLON DIVERTICULUM. *(Sp.)* Gutierrez Blanco, H. (Montivideo, Uruguay). *Prens Med Argent* 56(32):1532-1540, 1969.

4274 SEVERE PROCTORRAGIA IN CASE OF COLON DIVERTICULUM. *(Sp.)* Blanco, H. G. (Montivideo, Uruguay). *Prensa Med Argent* 56(23): 1115-1123, 1969.

4275 EMERGENCY SURGERY OF THE COLON. *(Sp.)* Martinez, D.M.A.R.J. (Central Milit. Hosp. Surgeon Major Dr. Cosmeargerich, Argentina). *Rev Sanid Milit Argent* 68(1):3-12, 1969.

4276 INTESTINAL VOLVULUS THROUGH SEGMENTARY ELONGATION OF THE TRANSVERSE COLON. *(Sp.* Borosky, P. (Cordoba, Argentina). *Prensa Med Arge* 56(31):1509-1513, 1969.

4277 APPENDICULAR ORIGIN OF GELATINOUS (ASCIT DISEASE OF THE PERITONEUM. *(Fr.)* Grand, (no affil), D. Grand and F. Bodin. *Vie Med* 50(42) 5487-5488, 1969.

4278 ANAL FISTULA. *(Sp.)* Cavagnaro, C. A. (Hosp. Emilio, Mendoza, Argentina). *Pre Med Argent* 56(34):1639-1644, 1969.

4279 CHEMOPROPHYLAXIS IN LARGE BOWEL SURGERY: I. EFFECT OF INTRAVENOUS ADMINISTRATION OF PENICILLIN ON INCIDENCE OF POSTOPERATIVE INFECTION. (*E.*) Hughes, E. S. R. (Roy. Melbourne Hosp., Australia), K. J. Hardy, A. M. Cuthbertson and S. Rubbo. *Med J Aust* 57(7):305-308, 1970.

4280 ELECTRIC ACTIVITY IN THE MEGACOLON. *(It.* Pisano, M. (Med. Dept. U. Catania, Italy L. Di Martino and L. Provenzale. *Boll Soc Ital Bi Sper* 45(12):832-834, 1969.

4281 SURGICAL MANAGEMENT OF SPHINCTER INSUFFICIENCY. *(Ger.)* Reichmann, W. (Surg. U. Clin., Cologne, Germany) and F. J. Stucker. *Chirur* 41(4):159-162, 1970.

82 APPENDICEAL PERITONITIS AND MEGACOLON IN THE NEONATAL PERIOD. (*E.*) Gastrin, U. Crown Princess Lovisa's Child. Hosp., Stockholm, weden) and S. Josephson. *Acta Chir Scand* 136(2): 3-155, 1970.

83 BOWEL RESECTION FOR DIVERTICULAR DISEASE OF THE COLON. (*E.*) Wilson, E. (Sydney osp., Australia). *Med J Aust* 57(5):204-207, 1970.

84 CARCINOMA OF THE COLON AND RECTUM AT THE UNIVERSITY HOSPITAL, JAMAICA. (*E.*) alrond, E. R. (U. Hosp., Jamaica, B. W. I.) and R. ordan. *West Indian Med J* 18(3):152-160, 1969.

285 RECTAL PROLAPSE. (*E.*) Paes, A. (Lourenco Marques, South Africa). *Med Proc* 16(5): 4-78, 1970.

286 COLONIC ILEUS. (*E.*) Decker, G. A. G. (Johannesburg Hosp., South Africa) and . D. Smith. *S Afr J Surg* 7(4):143-147, 1969.

287 APPENDICITIS IN THE NEWBORN INFANT. (*E.*) Parsons, J. M. (New York Hosp. Cornell Med. tr., New York), B. G. Miscall and C. K. McSherry. *urgery* 67(5):841-843, 1970.

288 PERFORATED DIVERTICULITIS OF THE COLON: SURGICAL MANAGEMENT. (*E.*) Sherman, L. Beth Israel Hosp., Denver, Colo.). *Rocky Mount Med* 67(4):51-53, 1970.

289 A COMPARISON OF PRIMARY INFLAMMATORY DISEASE OF THE COLON IN AUSTRALIA AND IN THE NITED STATES OF AMERICA. (*E.*) Cuthbertson, A. M. Melbourne, Australia), W. A. Hawk, R. B. Turnbull, r., and E. S. R. Hughes. *Aust New Zeal J Surg* 9(3):273-274, 1970.

290 JUVENILE POLYPOSIS COLI. (*E.*) Lane, D. (Mater Misericordia Hosp., Brisbane, ustralia). *Aust New Zeal J Surg* 39(3):264-267, 970.

291 LEIOMYOSARCOMA OF CECUM: A CASE REPORT. (*E.*) Palacios, D. A. (Oakland, Illinois). *Abdom Surg* 12(4):49, 1970.

292 VOLVULUS OF THE SIGMOID COLON AND CECUM. (*E.*) Shuck, J. M. (U. New Mexico Sch. Med., lbuquerque). *J Abdom Surg* 12(4):59-68, 1970.

293 DIFFERENTIAL DIAGNOSIS IN A SPECIAL CASE OF STENOSIS OF THE COLON. (*It.*) ccarpio, G. (Surg. Dept. U. Genoa, Italy), E. alestra and A. Faggioni. *Minerva Radiol* 14(11): 17-521, 1969.

294 INTERMITTENT LOCAL CHEMOTHERAPY IN THE TREATMENT OF UNRESPONSIVE COLO-RECTAL ANCERS. (*Fr.*) Rauber, G. (C.H.U. Nancy, France) nd M. Bessot. *Arch Franc Mal Appar Dig* 59(3):135-44, 1970.

4295 APPENDICITIS OF THE AGED. (*Ger.*) Kronberger-Schonecker, D. (U. Surg. Clin. Graz, Germany) and B. Rigler. *Zbl Chir* 94(49):1680-1685, 1969.

4296 "SALAZOPYRIN" IN THE TREATMENT OF GRANULAR PROCTITIS. (*E.*) Wilson, E. (Sydney Hosp., Australia). *Aust New Zeal J Surg* 39(3): 275-277, 1970.

4297 SURGERY OF RECTAL AND RECTAL-SIGMOID CANCER: EFFECTS UPON THE URINARY TRACT. (*Fr.*) Schimmel (no affil). *Bull Mem Soc Chir Paris* 59(5):245-251, 1969.

4298 PSEUDO-CANCEROUS APPENDICITIS: CASE REPORT. (*Fr.*) Cuny, G. (Hosp. St. Charles, Nancy, France), F. Penin and D. Robert. *Rev Franc Geront* 15(4):235-237, 1969.

4299 RECENT FINDINGS ON HEMORRHAGIC RECTOCOLITIS. (*Fr.*) Lambling, A. (C.H.U. Pitie-Saltpietriere, France) and J. Loygue. *Concours Med* 91(51):9657-9659, 1969.

4300 A SINGLE LAYER SUTURE AFTER RESECTION OF THE LARGE INTESTINE. (*It.*) Prior, C. (Dept. Surg., U. Genoa, Italy), M. Casaccia and A. Andrei. *Minerva Chir* 25(1):11-14, 1970.

4301 THREE PATIENTS WITH AN ABNORMAL ANUS AND DIARRHEA. (*Dut.*) Holstvoogd, L. (Dist. Hosp., Amsterdam, Netherlands) and E.A.G.H. De Gier. *Nederl T Geneesk* 114(13):541-544, 1970.

4302 IRRITABLE COLON SYNDROME. (*It.*) Zoppi, G. (Pediat. Clin. U. Ferrara, Italy), G. C. Andreotti and L. Boran. *Acta Paediat Lat* 22(5): 640-646, 1969.

4303 RECTAL PAPILLOMA WITH ELECTROLYTE DISORDERS. (*Ger.*) Werner, G. (Med. Acad. Erfurt, Germany), W. Wockel and I. Elsner. *Z Ges Inn Med* 25(1):41-44, 1970.

4304 TWO STAGE SURGERY OF RECTAL PROLAPSE. (*Ger.*) Geisthovel, W. (St. Bernard Hosp., Hildesheim, Germany). *Z Geront* 3(1):41-44, 1970.

4305 ESOPHAGOCOLOPLASTY AND THE VASCULAR MANAGEMENT OF THE LARGE INTESTINE. (*Ger.*) Kralik, J. (Surg. U. Clin., Geissen, Germany), V. Rapant and K. Turek. *Thoraxchirurgie* 18(1):57-64,1970.

4306 GARDNER'S SYNDROME WITH ACROMEGALY AND MIXED TUMOR OF THE PAROTID. (*Fr.*) Gadrat, J. (Hosp. Purpan, Toulouse, France), A. Ribet, P. Suduca, J. P. Pascal, J. Frexinos and M. Duffaut. *Arch Franc Mal Appar Dig* 59(3):163-170, 1970.

- P:Morph (3820)
- P:Absorp (4028) (4084)
- D:S.Intest (4225)
- D:S.Intest:Regent (4243)
- D:Pancreas (4329)
- D:Gen (4565) (4566) (4592) (4641)
- D:Gen:Parasit (4662)

4307 LIVER DISEASE IN ULCERATIVE COLITIS: I. ANALYSIS OF OPERATIVE LIVER BIOPSY IN 138 CONSECUTIVE PATIENTS HAVING COLECTOMY. *(E.)* Eade, M. N. (Birmingham Hosp., England). *Ann Intern Med* 72(4):475-487, 1970.

Histopathologic, clinical and biochemical relations were determined in 132 liver biopsies taken at the time of surgery from 132 patients who underwent colectomy. Forty-five percent of the biopsy samples showed fatty infiltration, and in 14% it was marked or gross while forty-seven percent showed inflammatory cellular infiltrates predominantly related to portal tracts, and in 12% it was moderate or marked. Other histological abnormalities observed were increased fibrosis (51%), bile duct proliferation (48%), mild to moderate hepatic cell necrosis (12%), bile stasis (42%), glycogen depletion of grades 0, 1 and 2 (72%) and severe glycogen depletion of grades 0 or 1 (32%). Overall, histological abnormalities were observed in 94% of the biopsies. Incidence of fatty infiltration was directly related to severity of colitis (but not to any other histological feature) and to elevation of alkaline phosphatase above 13 King-Armstrong units, but there was no relation noted when alkaline phosphatase was above 20 units. Inflammatory changes were present in 73% and cirrhosis in 3.8% of the biopsies. Chronic, continuous colitis was significantly associated with increased fibrosis. Alkaline phosphatase levels reflected bile duct proliferation, serum globulin elevations above 4.0 g/100 ml and inflammatory cellular infiltrations. Liver abnormalities were unrelated to blood transfusions, hepatotoxic drugs, previous jaundice, age of onset of colitis, or complications involving eyes, skin or joints.

4308 LIVER DISEASE IN ULCERATIVE COLITIS: II. THE LONG-TERM EFFECT OF COLECTOMY. *(E.)* Eade, M. N. (Birmingham Hosp., England), W. T. Cooke and B. N. Brooke. *Ann Intern Med* 72(4):489-497, 1970.

A 5-yr follow-up study of liver disease was performed on 110 patients with ulcerative colitis who had had a total colectomy. Serum alkaline phosphatase of 20 patients (18% of 110) was 15 King-Armstrong units or more, compared with a normal range of 3 to 14 units. In 61 patients (56% of 110) at follow-up, there was a sulfobromophthalein (BSP) retention of 5% or more at 45 min and 10% or more in 26 patients (24% of 110) compared to a normal retention of 0.4%. Except for four patients with cirrhosis, the elevated values for alkaline phosphatase and BSP retention appeared to have little correlation to visible histological pathology in 33 follow-up liver biopsies. Follow-up liver biopsy was available in 23 additional patients from second stage proctectomy or postmortem study. Comparison of the histological material with liver histology at colectomy in these patients revealed arrest or regression of liver disease following panproctocolectomy. Progression of liver disease occurred only in three patients with persistent colitis related to an ileorectal anastamosis. Panproctocolectomy is considered to have a definite place in management of liver disease complicating ulcerative colitis.

4309 ULCERO-HEMORRHAGIC RECTO-COLITIS IN PATIENTS OVER SIXTY-FIVE. *(Fr.)* Paris, J. (Lille, France) and J. C. Paris. *Ann Gastroent Hepatol* 6(1):19-26, 1970.

4310 CHANGED CLINICAL PATTERN OF ULCERATIVE COLITIS IN THE PAST DECADE. *(Cz.)* Nedbal J. (Dept. Internal Dis., Prague, Czechoslovakia), J Kudrmann and Z. Maratka. *Vnitrni Lek* 15(12):1183-1187, 1969.

4311 THE MANAGEMENT OF HYDROGEN ION AND ELECTR LYTE IMBALANCE IN ULCERATIVE COLITIS. *(It* Zaffiri, O. (Major Hosp. Trieste, Italy). *Minerva Med Giuliana* 9(3):148-151, 1969.

4312 INDICATIONS FOR SURGERY IN ULCERATIVE COLITIS. *(It.)* Pietri, P. (Inst. Path. Surg., U. Padua, Italy) and D. Oselladore. *Minerva Med Giuliana* 9(3):161-166, 1969.

4313 CORTICOSTEROIDS AND ACTH IN THE TREATMENT OF ULCERATIVE COLITIS. *(It.)* Benedetti, A. (Reg. Hosp. Udine, Italy). *Minerva Med Giuliana* 9(3):135-137, 1969.

4314 SEGMENTARY ULCERATIVE COLITIS. *(It.)* Di Giovanni, V. (Inst. Path. Spec. Surg. Catholic U. Sacred Heart, Rome, Italy) and L. Perrelli. *Gazz Int Med Chir* 74(23):2043-2065, 1969

4315 ULCERATIVE COLITIS AND CARCINOMA. *(It.)* Rovati, V. (1st Clin. Gen. Surg., U. Milan, Italy), M. Raule, R. Ramella and M. Galeone. *Minerva Med Giuliana* 9(2):123-127, 1969.

4316 SECRETORY FEATURES OF THE COLON MUCOSA IN ULCERATIVE AND GRANULOMATOUS COLITIS. *(It* Masera, N. (Inst. Path. Clin. Surg., U. Turin, Italy). *Minerva Med Giuliana* 9(2):115-116, 1969.

4317 ULCERATIVE COLITIS AND PREGNANCY. *(It.)* Tagliaferro, E. (Major Hosp. Trieste, Italy) and R. Botteghelli. *Minerva Med Giuliana* 9(2):117-122, 1969.

4318 INCIDENCE OF ULCERATIVE COLITIS IN FRIULI VENEZIA GIULIA. *(It.)* Domeniconi, R. (Dept. Anat. Surg., U. Trieste, Italy). *Minerva Me Giuliana* 9(2):108-111, 1969.

4319 PROCTO-SYGMOIDOSCOPIC FEATURES IN ULCERATIVE COLITIS. *(It.)* DiMarco G. (Inst. Clin. Med. Ther., U. Modena, Italy), G. P. Rigo and L. Loiodice. *Minerva Med Giuliana* 9(2):105-107, 1969.

4320 CLINICAL FEATURES OF ULCERATIVE COLITIS IN CHILDREN. *(It.)* Nixon, H. H. (Hosp. Sick Child., London, England). *Minerva Med Giuliana* 9(2):87-90, 1969.

4321 PATHOLOGICAL ANATOMY OF ULCERATIVE COLITIS. *(It.)* Giarelli, L. (Inst. Anat. Path. Histol., U. Trieste, Italy), G. Bianchi and G. Tosi. *Minerva Med Giuliana* 9(2):67-81, 1969.

4322 ETIOPATHOLOGY OF ULCERATIVE COLITIS. *(It.)* Torsoli, A. (2nd Med. Clin. U. Rome, Italy), G. Baldamenti and C. Croce. *Minerva Med Giuliana* 9(2):53-61, 1969.

4323 CLINICAL FEATURES OF ULCERATIVE COLITIS. *(It.)* Patrassi, G. (Clin. Gen. Med., U. Padua, Italy) and G. Realdi. *Minerva Med Giuliana* 9(2):82-86, 1969.

4324 CHRONIC ULCERATIVE COLITIS AND PERICHOLANGITIS. *(E.)* Nugent, F. W. (Lahey Clin. Found., Boston, Mass.) and F. F. Whitcomb. *Lahey Clin Found Bull* 19(2):55-60, 1970.

4325 THERAPEUTIC EXPERIENCES WITH γ-ORYZANOL (γ-OZ) IN ULCERATIVE COLITIS. *(Jap.)* Yasuhara, M. (Tokyo Munic. Komagome Hosp., Japan). *J Jap Ass Infect Dis* 43(10):277-282, 1970.

4326 PYODERMA GANGRENOSUM ASSOCIATED WITH ULCERATIVE COLITIS. *(Sp.)* Poch, R. P. (Hosp. Santa Cruz and San Pablo, Barcelona, Spain), J. M. De Moragas and F. Solduga. *Med Clin* 53(3):209-214, 1969.

- Diagproc (4020) (4021)
- D:S.Intest (4225)
- D:L.Intest (4299)

PANCREAS

4327 RECOVERY OF EXOCRINE PANCREATIC FUNCTION IN ADULT PROTEIN-CALORIE MALNUTRITION. *(E.)* Banks, P. A. (Brookline, Mass.), R. N. Tandon, P. K. George, S. K. Sama, K. Ramachandran and P. C. Gandhi. *Gastroenterology* 58(3):358-362, 1970.

A pancreozymin-secretin test of exocrine pancreatic function was performed in 8 adult patients (5 men, 3 women; average, 38 yr) with protein-calorie malnutrition who then were placed on a high protein diet (1.5 g/kg of animal protein; [illegible]0 cal/kg) for 12 to 14 weeks. Complete clinical recovery and improvement in serum hemoglobin, total proteins, and albumin occurred in all patients within 12 to 14 weeks. Weight gain averaged 7 kg in spite of initial weight loss of edema fluid. The high protein diet produced no change in pancreatic volume flow when compared with pretreatment and control volumes. There was no increase in basal protease, lipase, bicarbonate, and amylase concentrations following therapy (there were increases in these concentrations following stimulation). Repeated studies of pancreatic function indicated almost complete recovery of bicarbonate and lipase secretion and improvement of protease secretion. The persistence of a normal amylase response in protein-calorie malnutrition suggested adaptation to a high carbohydrate intake.

4328 CYSTIC FIBROSIS OF PANCREAS IN INDIA. *(E.)* Reddy, C. R. R. M. (Kurnool Med. Coll., India), C. Sita Devi, A. M. Anees, D. Prasantha Murthy and G. Eswar Reddy. *J Trop Med Hyg* 73(3):59-62, 1970.

An autopsy study of 12 cases of cystic fibrosis of the pancreas (a rare disease in India) in children under 10 years of age is presented, based on a study of 2,212 autopsies performed on natives of India ranging in age from a premature baby to a girl of 6. All 12 children were undernourished, eight had fever and diarrhea repeatedly, and three had fever and cough repeatedly. The sweat test was not performed and cystic fibrosis of the pancreas was not diagnosed until autopsy, at which time typical changes were seen in pancreas, lung and liver. The earliest pathognomic lesion in the pancreas was dilated acini with inspissated secretions while later changes consisted of gross fibrosis, dilatation of ducts with calcification of secretions, acinar and islet cell atrophy. The lung changes were in the form of bronchopneumonia, consolidation, chronic bronchitis, emphysema and atelectasis. The liver showed changes due to malnutrition and also to the primary disease itself. Bile duct hyperplasia was seen in one case and dilatation with inspissated secretions in the bile duct was seen in two cases.

4329 HISTOCHEMISTRY OF RECTAL MUCUS IN CYSTIC FIBROSIS OF THE PANCREAS. *(E.)* Johansen, P. G. (Roy. Child. Hosp. Res. Found., Melbourne, Australia) and R. Kay. *J Path* 99(4):299-306, 1970.

Histochemical staining and enzyme reactions in mucus-secreting epithelium were studied in 250 rectal biopsies from 68 children with cystic fibrosis of the pancreas and 65 normal children. Rectal biopsies were obtained by use of a multipurpose suction biopsy tube, and the tissues were stained to differentiate between sulpho- and sialo-mucins, using alcian blue (pH 1.0 or 2.5), colloidal iron, periodic-acid-Schiff (PAS), aldehyde fuchsin and toluidine blue (TB). Sections were incubated with the following enzymes: protease-free sialidase, crystalline pepsin, trypsin, papain, diastase and testicular hyaluronidase. Despite some individual variation, the histochemical studies demonstrated that both bound sulfate and sialic acid residues contribute to the characteristic basophilia of rectal mucus. No characteristic differences between cystic fibrosis and normal mucus was demonstrated by the histochemical techniques employed. Mucus was more copious in cystic fibrosis and in 75% of the biopsies from cystic fibrosis patients the crypts were moderately to severely dilated with discharged mucus and the goblet cells were swollen or elongated. A similar histological picture was observed in 20% of the non-cystic fibrosis controls, so this histological profile was not considered characteristic of cystic fibrosis tissue.

4330 THE FUNCTION OF THE EXOCRINE PANCREAS IN CHRONIC RENAL DISEASE. *(E.)* Bartos, V. (Dist. Hosp., Pardubioe, Czechoslovakia), J. Melichar and J. Erben. *Digestion* 3(1):33-40, 1970.

The exocrine function of the pancreas was studied (by the pancreozymin-secretin test) in 32 patients with chronic renal disease who were divided into 2 groups: 16 patients without renal failure and 16 patients with renal failure (of these, 7 were submitted to the chronic hemodialysis program). Normal function of the pancreas was found only in 28.1% of all patients and the dominating disorder was the decrease in the peak concentration of bicarbonate which was found in 50% of patients with renal failure and in 12.5% of patients without renal failure. There was a statistically significant correlation between the serum bicarbonate and both the peak concentration of bicarbonate and output of amylase in the pancreatic juice. Impaired pancreatic function seemingly may be important in the mechanism of the origin of duodenal ulcer and duodenal bleeding in uremia.

4331 LONG-TERM SURVIVAL IN PANCREATIC CANCERS. *(Fr.)* Jacobs, Ed. (Hosp. U. Saint-Pierre, Brussels, Belgium) and Ph. Paulet. *Acta Gastroent Belg* 32(12):961-970, 1969.

4332 CHRONIC DIARRHEA OF PANCREATIC ORIGIN IN CHILDREN (EXCLUDING CYSTIC FIBROSIS OF THE PANCREAS). *(Fr.)* Deschamps, J. P. (no affil). *Med Infant* 76(10):815-819, 1969.

4333 SEVERE GASTROINTESTINAL BLEEDING FOLLOWING ERUPTION OF AN UNDETECTED POSTTRAUMATIC PSEUDO-CYST OF THE PANCREAS. *(Fr.)* Soustelle, J. (Lyon, France), R. Bertocchi, L. Fischer, F. Fournat and P. Vuillard. *Mem Acad Chir* 95(28-29):816-818, 1969.

4334 CYSTIC ADENOMA AND CYSTIC ADENOCARCINOM OF THE PANCREAS. *(Ger.)* Girardin, R. (Hosp. St. Antoine, Paris, France), A. Gauchet an M. Hivet. *Internist Prax* 9(4):623-629, 1969.

4335 THE DIGESTIVE SYNDROME OF CYSTIC FIBROS OF THE PANCREAS. *(Fr.)* Deschamps, J. P (no affil). *Med Infant* 76(10):805-812, 1969.

4336 SELECTIVE ARTERIOGRAPHY IN THE DIAGNOSI OF PANCREAS ADENOMA. *(Sp.)* Stoopen, M. (Ctr. Med. Natl., Mexico), V. Guarner, L. Elizond and L. Landa. *Rev Mexicana Radiol* 23(5-6):231-24 1969.

4337 PANCREATOLITHIASIS. *(Pol.)* Dyktynski, (Louis Pasteur Hosp., Lodz, Poland) and R. Kabza. *Pol Przegl Radiol* 33(6):767-770, 1969.

4338 INHIBITION OF ETHANOL TOXICITY BY LYSIN OROTATE (ORL). *(E.)* Thomas, H. M. (Ins Med. Chem., U. Uppsala, Sweden). *FEBS Letters* 7(291-292, 1970.

4339 TRAUMATIC TRANSECTION OF THE PANCREAS TREATED BY DISTAL PANCREATECTOMY AND SPLENECTOMY: A CASE REPORT. *(E.)* Ho, W. C. (Whi Rock, British Columbia, Canada). *Canad J Surg* 13(2):157-162, 1970.

4340 EVALUATION OF PALLIATIVE OPERATIONS FOR CARCINOMA OF THE HEAD OF THE PANCREAS: TEN YEAR STUDY. *(E.)* Vijayanagar, R. (VA Hosp., Bronx, N. Y.) and S. H. Tollins. *Mount Sinai J M* 37(2):115-118, 1970.

4341 MASSIVE HEMORRHAGE AFTER CYSTOGASTROSTO FOR PANCREATIC PSEUDOCYST. *(E.)* Dey, (Pindersfields Hosp., Wakefield, England) and C. Clark. *J Roy Coll Surg Edinb* 15(2):99-101, 1970.

4342 PANCREAS NEURINOMA: ICTERUS AND CEPHAL PANCREATECTOMY IN AN 11 YEAR OLD CHILD. *(It.)* Romualdi, C. (Hosp. Polyclin., Umberto I, Rome, Italy). *Riv Chir Pediat* 11(3):278-291, 19

4343 EXOCRINE SECRETION ACTIVITY OF THE PANCREAS IN ACROMEGALY. *(It.)* Bertero, R. (Dept. Med., U. Turin, Italy), G. Bruno, A. Palmo and O. Losana. *Minerva Gastroent* 15(4): 175-180, 1969.

4344 ADULT CYSTIC FIBROSIS (MUCOVISCIDOSIS): FATTY REPLACEMENT OF THE PANCREAS IN A WOMAN AGED 47 YEARS. *(E.)* Jones, J. S. (Roy. Sea Bathing Hosp., Margate, Kent, England). *Brit J* *Chest* 64(1):25-36, 1970.

- Diagproc (4019) (4057) (4064) (4082) (4084)
- D:L.Intest (4265)

45 PROTEIN SYNTHESIS IN ACUTE PANCREATITIS.
(E.) Machovich, R. (U. Med. Sch. Budapest,
ngary), M. Papp and I. Fodor. *Biochem Med* 3(5):
6-383, 1970.

e alteration of the rate of *de novo* protein syn-
esis in acute pancreatitis and a possible cause
the change in protein synthesis was studied in
le mice and pigeons by inducing acute pancreatitis
the injection of 1% deoxycholate solution, and re-
ving the pancreas after 1, 24, or 96 hr. The *in*
tro incorporation of ^{14}C-valine into proteins in
inar cells decreased significantly after the in-
ction of pancreatitis and the observed decrease of
otein synthesis in acinar cells could not be attri-
ted to the damage of the ribosomes (since the ribo-
mes were able to incorporate radioactive amino
id). A thermostable component of low molecular
ight which inhibited valyl-tRNA synthetase and
ich appeared to accumulate in acute pancreatitis,
s extracted from rat pancreas. In acute pancrea-
tis the activities of amylase (2050 U/mg protein)
d trypsin-like enzymes (6.2 μg/mg protein) de-
eased from the respective control levels of 3000
mg protein and 85.5 μg/mg protein whereas the
ee amino acid pool increased.

46 THE VALUE OF DEXTRANS IN THE TREATMENT OF
EXPERIMENTAL PANCREATITIS. *(E.)* Goodhead,
(U. Texas Med. Sch., San Antonio) and P. W.
ght. *Surgery* 67(5):807-815, 1970.

comparative value of low molecular weight dextran,
inical dextran, plasma, and normal saline in the
atment of experimental hemorrhagic pancreatitis
studied in 58 dogs. Acute hemorrhagic pancreati-
induced by injecting trypsin digested blood into
pancreatic duct was fatal. Treatment with 1 g/kg
low molecular weight dextran prevented hemorrhagic
creatitis from developing while treatment with
her 1 g/kg of clinical dextran or 10 ml/kg of
ine plasma resulted in a reduction of morbidity
es but did not prevent hemorrhagic or severe
matous pancreatitis. A 12-hr delay in initiating
atment with low molecular weight dextran was still
sociated with a reduction in morbidity and mortality
es. The development of hemorrhagic pancreatitis
apparently dependent on changes which result in
reduced blood flow in the pancreatic microcircula-
on and prevention of these changes inhibits the
velopment of hemorrhagic pancreatitis.

47 THE PRODUCTION OF CALCIUM AND MAGNESIUM
DURING PANCREATIC FUNCTION TESTS IN HEALTH
) DISEASE. *(E.)* Nimmo, J. (Roy. Inf., Edinburgh,
otland), N. D. C. Finlayson, A. F. Smith and
J. C. Shearman. *Gut* 11(2):163-166, 1970.

8 patients with pancreatic disease (3 with relaps-
g pancreatitis, 4 with chronic pancreatitis, 1 with
ncer) and 17 patients without pancreatic disease
with epigastric pain, 3 with duodenal ulcer, 3
rmals, 4 with celiac disease, Klinefelter's syn-
ome, weight loss, or chronic renal failure, resp.),
terminations were made of duodenal calcium and
gnesium concentrations after pancreatic stimulation with secretin (3 U/kg body weight i.v.). The concentration of both ions was significantly higher in those with pancreatic disease (3.7 versus 0.8 mg/100 ml for calcium), and these patients showed a different secretory pattern. In all patients without pancreatic disease there was an inverse relationship between bicarbonate concentration and calcium concentration. The same relationship existed for magnesium. An analysis of the calcium/magnesium ratios made on all samples showed that there was no difference between those with and without pancreatic disease. These findings may be relevant to the etiology of pancreatitis and to pancreatic calcification, and might be of diagnostic value.

4348 ACUTE PANCREATITIS FOLLOWING TRANSLUMBAR AORTOGRAPHY. *(Ger.)* Witzel, L. (Med. Clin. Polyclin. U. Erlangen-Nuremberg, Germany). *Med Klin* 65(14):661-663, 1970.

4349 THERAPY FOR ACUTE PANCREATITIS. *(Ger.)* Gigglberger, H. (Barmherzigen Bros. Hosp. Regensburg, Germany). *Therapiewoche* 20(11):456-465, 1970.

4350 OBSERVATIONS ON THE USE OF XYLAMIDE (MILID) AS AN ANTISECRETORY AND ANTI-GASTRIN SUBSTANCE IN ACUTE PANCREATITIS. *(It.)* Margnelli, M. (Carlo Borella Hosp., Giussano Brianza, Italy), R. Zacco and G. F. Velati. *Minerva Gastroent* 15(4):229-234, 1969.

4351 CALCAREOUS PANCREATITIS AND DISTURBANCES OF PHOSPHOROUS/CALCIUM METABOLISM: DIAGNOSIS OF HYPERPARATHYROIDISM AND VITAMIN AND CALCIUM MALABSORPTION. (*Fr.*) Cabanel, G. (C.H.U. Grenoble, France), X. Phelip, R. Voog, M. P. Berthon, J. M. Verdier, J. P. Gras and L. Gilot. *J Med Lyon* (1180): 453-474, 1970.

4352 HEART COMPLICATIONS IN ACUTE PANCREATITIS. *(Fr.)* Caillard, B. (Hosp. Bocage, Dijon, France), J. L. Brenot, G. Rifle, R. Michiels, J. Verbet and G. Protheau. *Anesth Analg* 26(6):911-918, 1969.

4353 TOTAL PANCREATECTOMY IN A CASE OF ACUTE NECROTIC PANCREATITIS. *(Fr.)* Spay, G. (no affil), O. Chadenson, E. Perrot, M. Jarossin and M. Guillard. *Lyon Med* 222(45):1143-1156, 1969.

4354 ACUTE PANCREATITIS: INTRA-ARTERIAL TREATMENT WITH TRASYLOL. *(E.)* Vestad, E. (Ulleval Hosp., Oslo, Norway) and T. Aakhus. *Acta Chir Scand* 136(2):147-151, 1970.

4355 SURGICAL TREATMENT OF CHRONIC ALCOHOLIC PANCREATITIS. (*Por.*) Schmidt Goffi, F. (Fac. Med. U. San Paulo, Brazil), J. A. Mattar, S.

Pellizon, H. Ushikusa, E. Ferrarini and S. Quaglia. *Rev Ass Med Brasil* 15(11):463-468, 1969.

4356 ACUTE PANCREATITIS PRODUCED BY DIURETICS. *(Hun.)* Szende, L. (Tonacz Janos Hosp., Budapest, Hungary), R. Janos and T. Jozsef. *Magyar Belorv Arch* 22(6):313-317, 1969.

4357 PARTIAL PANCREATECTOMY BY MEANS OF THE STAPLER ULK-60. *(Pol.)* Ziarek, S. (1st Surg. Clin., Zabrz, Poland), E. Szlachta, J. Puzio, E. Migas and J. Pierzycki. *Pol Przegl Chir* 41(12):1749-1751, 1969.

4358 FORMATION AND DESTRUCTION OF PLASMA KINI DURING EXPERIMENTAL ACUTE HEMORRHAGIC PANCREATITIS IN DOGS. *(E.)* Ofstad, E. (Dist. Hosp. Oslo, Norway). *Scand J Gastroent* 5(supp. 5):1-44, 1970.

4359 THE DEVELOPMENT OF PANCREATIC SECRETORY INSUFFICIENCY IN A PATIENT WITH RECURREN PANCREATITIS AND TYPE V HYPERLIPOPROTEINEMIA. *(E.)* Salen, S. (Mt. Sinai Sch. Med., City U. New York, N.Y.), J. I. Kessler and H. D. Janowitz. *Mount Sinai J Med* 37(2):103-107, 1970.

- Diagproc (4015) (4065)
- D:Stomduo (4131)
- D:Livbil:A.V.Hep (4474)
- D:Gen (4631)

LIVER AND BILIARY TRACT

4360 EFFECTS OF IRRADIATION ON THE CELL OF AN EXPERIMENTAL ASCITES TUMOR OF THE MOUSE. *(E.)* Frindel, E. (Inst. Gustave Roussy, Villejuif, France), F. Vassort and M. Tubiana. *Int J Radiat Biol* 17(4):329-337, 1970.

The experimental ascites tumor form of fibrosarcoma was obtained by i.p. injection of NCTC 2472 cells cultured *in vitro* and maintained by weekly passage, into mice, for the study of parameters of growth kinetics measured at different times after irradiation with 250 rads in young (4-day) fast-growing tumors and in older (12-day) slower growing tumors. After irradiation, the duration of the G_2 phase of growth is lengthened in the old tumors and unchanged in the young ones. In the younger tumors there is an accumulation of cells in the G_1 phase while in the older tumors the accumulation of cells is mostly in the G_2 phase. (In the cytophotometric study method used, it is possible to distinguish 4 groups of cells: labeled cells, cells in mitosis, cells in G_1 which are not labeled and have a low content of DNA, and cells in G_2 which are not labeled and have a high content of DNA.) The duration of the cell cycle is lengthened after irradiation in the young tumors, but this effect seems to be reversible; and it also seems to be lengthened in the old tumors but with the available data it is not possible to calculate the duration of the cell cycle. Comparison of the reactions of normal and tumor tissue to irradiation is difficult, since in normal tissue there is a compensatory proliferative activity of the surviving cells; however, after an equal dose of radiation, the rate of recovery seems to be slower in tumor than in normal tissues. In malignant tumors, the age of the tumor and the time elapsed after irradiation seemingly are some of the factors which influence the radiation effect on the cell kinetics.

4361 HEPATOMAS IN CBA/Cb/Se MICE AND LIVER LESIONS IN GOLDEN HAMSTERS INDUCED BY HYDRAZINE SULFATE. *(E.)* Biancifiori, C. (Perugia U Med. Sch., Italy). *J Natl Cancer Inst* 44(4):943-953, 1970.

Male and female virgin CBA/Cb/Se mice were treated daily with hydrazine sulfate to study the carcinogenic effect of this drug on the liver. The daily administration of 1.13 mg of hydrazine sulfate by stomach tube resulted in the incidence of hepatoma to increase from 10 and 3.4% in untreated male and female controls, resp., to 60 and 62.5%, resp. A dose of 0.56 mg of hydrazine sulfate caused an incidence of hepatoma of 48 and 66.6% in males and females, resp.; 0.28 mg of hydrazine sulfate caused a rate of 28% in males and 8% in females; and anima treated with 0.14 mg of hydrazine sulfate showed a incidence of 3.8% in males and 0% in females. The most frequently observed tumors were highly vascularized hepatocarcinomas. The administration of hydrazine sulfate to virgin golden hamsters of bot sexes caused liver reticuloendothelial cell prolife ation (85 to 97%) and cirrhosis, bile duct prolifer ation (31%) and degeneration of fibrous cells in th hyalinized sclerotic tissue (20.6%). No liver lesions were observed in the untreated controls.

4362 METABOLISM BEFORE AND AFTER HEPATIC LOBECTOMY. *(E.)* Molander, D. W. (Pack Med. Found., New York, N. Y.) and G. T. Pack. *Recent Results Cancer Res* 26:259-270, 1970.

The biochemical and metabolic changes occurring in 40 patients subjected to hepatic lobectomy (30 to right lobectomy and 10 to left lobectomy) are presented together with a brief review of the litera-

e. Predominating symptoms of the patients were:
alpable mass in the liver, pain, jaundice and
rexia associated with weight loss. Serum bili-
in was raised in 20% of the patients due to
truction of a major biliary excretory duct.
er function tests showed an elevated SGOT in
ients with bilateral liver involvement, an in-
ased serum 5-nucleotidase in 25%, a decreased
linesterase in 36%, and a decreased serum pro-
n level below 6.5% in 45% of the patients.
hin 24 hr following lobectomy, all patients
wed an elevation of serum bilirubin, particularly
the conjugated fraction and by the 5th post-
rative day, 45% had normal bilirubin levels.
aline phosphatase was raised postoperatively but
the end of the third week was normal in 90% of
patients. Postoperative management included
. dextrose (125-150 mg daily, with 2 cc of
occa-C), administration of vitamin K_1 (10 mg
.d.), serum albumin (25 mg/day for 5 days), and
tisone (12.5 mg b.i.d. for 5 days) following
ht total hepatic lobectomy.

3 THE LIVER IN CONGENITAL HEART DISEASE: EFFECTS OF INFANTILE COARCTATION OF THE
TA AND THE HYPOPLASTIC LEFT HEART SYNDROME IN
ANCY.

(E.) Weinberg, A. G. (Child. Hosp. Akron,
o) and R. P. Bolande. *Amer J Dis Child* 119(5):
-394, 1970.

er sections from 137 cases of congenital heart
ease dying before 1 month of age were reviewed
define the occurrence of severe liver injury
plicating congestive heart failure in the neo-
al period as manifested by centrolobular and
zonal hepatic necrosis. A striking incidence
hepatic necrosis was found in association with
antile coarctation of the aorta and the hypo-
stic left heart syndrome. Necrosis was present
27/72 (37.6%) cases of these two hemodynamically
ated groups of defects but was found in associa-
n with only 4/65 (6.1%) of all other cardiac de-
ts. In 22.6% of the 27 patients manifesting ne-
sis, clinical bleeding occurred which was at
st in part related to this hepatic injury and
of those cases in which bleeding occurred were
ompassed by the group of infantile coarctation
the hypoplastic left heart syndrome.

4 AMINO ACID METABOLISM IN HEREDITARY FRUCTOSEMIA.

(E.) Lindemann, R. (Dikemark Hosp.,
er, Norway), L. R. Gjessing, B. Merton, A. C.
en and S. Halvorsen. *Acta Paediat Scand* 59(2):
-147, 1970.

ee cases of hereditary fructosemia with symptoms
hepatomegaly, edema and ascites in early infancy
e with a lethal course) are presented. All 3
es had normal serum electrolytes (except for re-
ed values after fructose ingestion) while plasma
tein levels were low and metabolic acidosis fol-
ed the prolonged ingestion of fructose. Amino-
duria and aminoacidemia were found in all 3
ldren, while the amino acids in the ascitic fluid
e within normal limits (except for methionine
ch was about 6 times the normal). The urinary excretion of tyrosine, phenylalanine, and proline were increased.

4365 THE BLEEDING DISORDER IN HEPATOMEGALIC FORMS OF GLYCOGEN STORAGE DISEASE.

(E.) Nilsson, I. M. (Allmanna Hosp., Malmo, Sweden) and P. A. Ockerman. *Acta Paediat Scand* 59(2):127-133, 1970.

The bleeding disorder in glycogen storage disease was studied in 6 patients with type I, and 2 patients each of type III and VI. The most commonly seen anomalies were prolonged Ivy bleeding in 7 cases, low values for platelet adhesiveness in 5 cases, increased number of platelets in 5 cases, and high values for prothrombin (4 cases) and fibrinogen (8 cases). Patients with type I and VI and, possibly, also type III may have a bleeding disorder similar to thrombosthenia; and when operations are necessary or in accidental bleeding in patients with glycogen storage disease, fresh thrombocyte-rich blood or thrombocyte suspensions may be needed to normalize the bleeding tendency. The blood substitute, Macrodex, should not be used in these patients since it would increase the bleeding tendency.

4366 HEPATIC CELL NECROSIS IN THE NEWBORN: A PATHOLOGIC STUDY OF 147 CASES, WITH PARTICULAR REFERENCE TO CONGENITAL HEART DISEASE.

(E.) Shiraki, K. (Child. Hosp., Los Angeles, Calif.). *Amer J Dis Child* 119(5):395-400, 1970.

The relation of hepatic cell necrosis to other pathological conditions was studied in 147 infants who died from birth to 7 days of age. Disseminated hepatic necrosis was significantly correlated with congenital heart disease, and hypoplastic left heart complex and coarctation of the aorta were more frequently associated with disseminated hepatic necrosis than were other types of congenital heart disease. Of the 147 patients studied, 19 (12.9%) showed disseminated hepatic necrosis, and 17 (11.6%) showed localized hepatic necrosis. None of these patients with hepatic necrosis had Herpes simplex hepatitis, coxsackievirus infection, listeriosis, or other known specific causes of neonatal hepatic damage. Fatty vacuolization of hepatic cells was present in 66 patients. Marked fatty vacuolization of hepatic cells was seen in 21 patients of which 11 also showed disseminated hepatic necrosis, and 3 localized hepatic necrosis. In the series without necrosis, 45% of the deaths occurred within 48 hr of life, and the incidence decreased rapidly after the third day. Cases of disseminated hepatic necrosis were not seen before 48 hr of age. Congenital heart disease was revealed at autopsy in 15 of the disseminated hepatic necrosis series and in 19 patients without necrosis. Localized hepatic necrosis was significantly correlated with gastroschisis, omphalocele, or diaphragmatic hernia, and hemorrhage in portal areas was associated with the presence of intracranial hemorrhage. The microscopic features of the liver in these types of congenital heart failure were not those of congestive heart failure, and the hepatic changes observed were considered more probably due to decreased arterial blood flow than to passive venous congestion.

4367 LIVER CELL RESPONSES TO THE CARCINOGEN 3'-METHYL-4-DIMETHYLAMINOAZOBENZENE.

(E.) Hughes, P. E. (Baker Med. Res. Inst., Melbourne, Australia). *Chem Biol Interact* 1(3): 301-305, 1970.

Rats were fed the aminoazo dye 3'-methyl-4-dimethylaminoazobenzene (0.06%) for 1 to 6 weeks and the subsequent incidence of hepatoma was recorded and estimations of polar protein-bound dye and proliferative response (as measured by mitotic counts) were determined. In rats fed dye for 3 weeks or less, no tumors resulted, while practically all rats fed dye for 5 or more weeks developed hepatic neoplasms. The level of polar protein-bound dye rose to a peak at day 10 of dye-feeding and showed a small rise between days 30 and 40. Histologically, proliferative changes involving bile-duct epithelium predominated; however, after 5 weeks of dye feeding the proportion of parenchymal cells increased. The counts of mitoses were at low levels to day 21, reached a peak on day 38 and then fell. Cessation of dye feeding one week or more after the dye-induced proliferative response gave a maximum yield of tumors. Tumor development seemingly involves a proliferative response in the presence of a carcinogen.

4368 MITOTIC RESPONSES TO PARTIAL HEPATECTOMY IN PRENEOPLASTIC RAT LIVER.

(E.) Hughes, P. E. (Baker Med. Res. Inst., Melbourne, Australia). *Chem Biol Interact* 1(3):315-320, 1970.

When rats were subjected to partial hepatectomy a peak in mitosis occurred at about 28 hr postoperatively and a second partial hepatectomy in the same rat produced a mitotic response similar in time and magnitude. Rats fed the carcinogenic dye 3'-methyl-4-dimethylaminoazobenzene (3'-MeDAB) exhibited a marked proliferative response after 4 weeks of feeding. In those rats which did not show a proliferative response in the presence of carcinogenic 3'-MeDAB or potentially carcinogenic 2'-MeDAB, partial hepatectomy evoked a regenerative mitotic peak at 28 hr postoperatively, but in those rats which had a proliferative response during carcinogenic dye feeding partial hepatectomy evoked a different type of regenerative mitotic response with a peak in mitoses about 60 hr postoperatively. If, however, a proliferative response in rat liver occurred in the presence of an aminoazo dye, subsequent partial hepatectomy provoked an altered mitotic responsiveness with a peak in mitoses at 60 hr. Once an extensive proliferative response has occurred in liver in the presence of an aminoazo dye capable of binding to liver macromolecules the following changes apparently occur in the liver: 1) an inevitable progression towards malignancy even if dye-feeding is stopped, and 2) a delayed mitotic responsiveness to partial hepatectomy.

4369 TREATMENT OF INOPERABLE CANCER OF THE LIVER BY INTRA-ARTERIAL RADIOACTIVE ISOTOPES AND CHEMOTHERAPY.

(E.) Ariel, I. M. (Hosp. Joint Dis., New York, N. Y.) and G. T. Pack. *Recent Results Cancer Res* 26:277-292, 1970.

Patients with inoperable liver cancer were treate by intra-arterial (aortic and hepatic arteries) administration of anticancer therapeutic agents a radioactive isotopes in the form of ^{90}yttrium and radiating microspheres. In one group of patients the drugs were administered directly into the aort at the level of the celiac axis; in a second grou of patients, administration was directly into the hepatic artery. The two most frequently used dru were methotrexate (100-300 mg total) and 5-fluorouracil (3-10 g intra-arterially for 5-20 days); in several patients calcium leucovorin (6-9 mg i. every 6 hr) was given. A series of 22 patients was treated with chemotherapeutic agents via the aorta and hepatic arteries; 6 patients (27%) show objective responses (measurable decrease in the size of the enlarged liver) and 13 (59%) showed subjective responses (relief of pain, increased strength, sense of well-being). Of 37 patients treated with intra-arterial radioactive isotopes via the aorta and hepatic arteries, 12 patients (32%) showed objective responses and 20 (54%) showed subjective responses. Of the 59 patients treated with intra-arterial combined isotope therapy and chemotherapy via the aorta and hepatic arteries, 28 (47%) showed objective responses and 41 (61%) showed subjective responses. For those patients treated by chemotherapy alone via the aorta, the average duration of life was 2.8 month and for those treated via the hepatic artery, the average duration of life was 4.9 months. Of the 37 patients who were treated by intra-arterial radioactive isotopes alone, 4 patients remained alive for periods from 4 to 18 months. The avera duration of life for aortic administration was 6 months and for hepatic artery administration 3.1 months. Of the 59 patients receiving combined therapy, 4 remained alive for periods of 5 to 36 months. Of those who expired and received intra-aortic administration, the average duration of li was 6.3 months, and 4.9 months when given via the hepatic artery.

4370 HEPATIC GLYCOGENOLYSIS INDUCED BY GLUCAGON IN A PATIENT WITH A TYPE I LIVER GLYCOGEN DISEASE.

(E.) Sarcione, E. J. (U. Buffa Sch. Med., New York), J. E. Sokal and C. U. Lowe. *Biochem Med* 3(4):337-343, 1970.

Direct evidence was obtained (by chemical and isotopic measurements) that glucagon induced active hepatic glycogenolysis in a 5-year-old girl with Type 1 liver glycogen disease, at a rate comparab to that observed in normal rats and dogs and, presumably, in normal man. After a 4-hr fast, a rapid infusion of 10% glucose (100 ml/30 min) was started to induce hyperglycemia, 30 min later 100 of radioactive labeled glucose was administered p.o., and 3.5 hr later, glucose infusion was stop and i.v. glucagon (25 μg/min) was started. Liver

opsies were done and liver glycogen and blood
ucose radioactivity levels were measured. At the
art of the procedure, after the 4-hr fast, blood
ucose level was 26 mg/100 ml and blood lactate
vel was 119 mg/100 ml while after 30 min of rapid
ucose infusion, blood glucose was elevated to 276
/100 ml and blood lactate declined to 70 mg/100 ml.
perglycemia was maintained for more than 1 hr after
ministration of labeled glucose and the blood lac-
te concentration declined progressively during the
5 hr that blood glucose was supported by glucose
ansfusion, reaching a nearly normal level of 22
/100 ml at the end of that period. Mild hypo-
ycemia (48 mg/100 ml) developed after glucagon
fusion was started, and blood lactate rose sharp-
to 75 mg/100 ml 25 min after glucagon infusion
s started. Both exogenous and endogenous glucagon
emingly exert their glycogenolytic effects in this
sease, but the end product apparently is lactic
id rather than glucose.

71 POSSIBLE REQUIREMENT OF ADENOSINE TRIPHOSPHATE FOR THE REJOINING OF X-RAY-INDUCED
EAKS IN THE DNA OF EHRLICH ASCITES-TUMOR CELLS.
.) Matsudaira, H. (Natl. Cancer Ctr. Res. Inst.,
ukiji, Tokyo, Japan), I. Furuno and H. Otsuka.
t *J Radiat Biol* 17(4):339-347, 1970.

male albino ddN mice (25 g) carrying 4-day-old
ar-diploid Ehrlich ascites-tumor cells were used
the study of changes in the tumor cell metabolism
sociated with post-irradiation (3900 R dose) as
amined after *in vitro* incubation under nitrogen at
atmosphere in phosphate-buffered saline in the ab-
nce of glucose - conditions (which do not allow the
joining of X-ray-induced breaks in the DNA). There
s a marked reduction in the incorporation of radio-
tive precursors into DNA, RNA, protein, and thymi-
ne triphosphate under these conditions compared with
cubation in air, and this reduction was partially or
mpletely abolished by adding glucose to the incuba-
on medium. After incubation under nitrogen without
ucose the intracellular content of ATP was greatly
creased which was also partially prevented by the
dition of glucose. No significant change was ob-
rved in the nicotinamide-adenine dinucleotide con-
nt in the cells incubated under similar conditions.
ta strongly support the idea that ATP is probably
quired for the rejoining of X-ray-induced breaks in
e DNA of Ehrlich ascites-tumor cells.

72 CHEMICAL AND BIOCHEMICAL CHANGES IN SUBCELLULAR FRACTIONS OF GUINEA PIG LIVER
RING INFECTION WITH *COXIELLA BURNETI*. *(E.)* Paret-
y, D. (Dept. Microbiol., U. Kansas, Lawrence) and
Stueckmann. *J Bacteriol* 102(2):334-340, 1970.

creased RNA, protein, and enzyme (phosphorylase,
ucose-6-phosphatase, and glucosyl transferase)
tivities were found in the rough endoplasmic retic-
um and pellet fractions of livers of male guinea
gs infected with *Coxiella burneti* compared with
ntrols. Phosphorylase and glucosyl transferase
lycogen synthetase) were most abundant in the
ycogen-rich pellet fraction of normal microsomes
t were absent or greatly reduced in the pellet
fraction during infection with *Coxiella burneti* (liver glycogen was also greatly reduced). Glucose-6-phosphate was chiefly distributed in the smooth and rough endoplasmic reticulum and like phosphorylase, in the cell sap fraction. A solubilization of the phosphorylase and synthetase, with the enzymes moving from the RER and glycogen-containing pellet fraction to the cell sap. The RER is the subcellular fraction which seems to be most affected during Q fever.

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4442 LIVER INVOLVEMENT IN GOUT. *(Ger.)* Hennecke, A. (Med. Clin., Robert Koch Hosp., Hannover, Germany) and H. Sudhof. *Deutsc Med Wschr* 95(2):59-62, 1970.

- P:Morph (3806) (3808) (3831) (3848)
- P:Absorp (3940) (3953) (3966) (3973)
- P:Gen (4012)
- Diagproc (4016) (4018) (4019) (4025) (4027) (4032) (4035) (4037) (4039) (4040) (4044) (4045) (4053) (4054) (4058) (4061) (4062) (4069) (4073) (4078) (4079) (4085) (4086) (4089)
- D:L.Intest:Ulccol (4307) (4308)
- D:Livbil:Gallb (4533)
- D:Gen (4569) (4588) (4616) (4621) (4626) (462 (4638)
- D:Gen:Parasit (4661) (4666) (4675) (4676) (46 (4680) (4681) (4683) (4686) (4687)

Acute Nonviral Hepatitis and Hepatic Injury

3 ULTRASTRUCTURAL FEATURES IN GALACTOSAMINE-INDUCED HEPATITIS. *(E.)* Medline,
(Mount Sinai Sch. Med. City U. New York, New
c), F. Schaffner and H. Popper. *Exp Molec Path*
2):201-211, 1970.

ultrastructural features and functional altera-
ns in the liver produced by six separate i.p.
ections of d-galactosamine (250 mg/kg) were
lied by light and electron microscopy and by
unofluorescence in male Sprague-Dawley rats. A
ty necrotic hepatitis (shown by light micros-
) occurred within 1 day, and submassive necro-
within 2 days after d-galactosamine administra-
. Electron microscopic examinations of the
r within 1 day after d-galactosamine adminis-
tion revealed extensive hypertrophy of the
th endoplasmic reticulum, glycogen depletion,
somes and larger fat droplets, mitochondrial
gularities, large cytoplasmic vacuoles contain-
serum proteins, and decreased numbers of ribo-
s with nucleolar changes. Organelles in all
r cells were affected by these changes, however,
primary target organelle was not identified.
bile canaliculus and its microvilli were not
ected by d-galactosamine and there was ultra-
uctural evidence of cholestasis. Immunofluo-
cent studies revealed that many of the larger
-positive intracytoplasmic droplets fluoresced
ongly after incubation with rabbit anti-rat α-
bulin and rabbit anti-rat fibrinogen (both
eled with fluorescein). Total and direct-re-
ing bilirubin levels and alkaline phosphatase,
T and SGPT activities were increased in rat
um after d-galactosamine administration. Al-
ugh light microscopy revealed that d-galactos-
ne produces lesions (spotty necrosis) similar
those in viral hepatitis, electron microscopy
ealed that the ultrastructural features (espe-
lly the presence of large vacuoles containing
teins) are different from those of viral hepa-
is. Galactosamine-induced hepatitis seemingly
resents a valuable experimental model of diffuse
er cell injury with focal accentuation.

44 HISTOCHEMICAL STUDIES ON THE ACTION OF AFLATOXINS: II. A CYTOLOGICAL AND CYTO-
MICAL STUDY OF LIVER OF RATS FED A DIET CONTAMI-
ED WITH *ASPERGILLUS PARASITICUS*. *(E.)*
tkiewski, K. (Med. Acad. Poznan, Poland), J.
icki, L. Malendowicz, M. Urbanowicz and B.
ipiak. *Folia Histochem Cytochem* 8(1):47-58, 1970.

iet contaminated with the mould, *Aspergillus*
asiticus, was fed to rats and the cytological and
ochemical effects of metabolites (aflatoxins) of
mould on the liver were determined. After 10
s feeding, the liver was characterized by pro-
feration of oval cells in bile canaliculi combined
h the necrosis of some of the hepatocytes in the
riphery of the lobule. The proliferating oval cells
se either from the epithelium of the bile canalic-
i or through differentiation from hepatocytes and
se processes were accompanied by an increase in
Brachet reaction in the proliferating ductuli and
decline of glycogen content in the liver. The
liferating oval cells showed only poor reactions
for acid phosphatase, non-specific enterases, and TPPase whereas strong reactions for alkaline phosphatase and ATPase occurred in the basement membranes of the proliferating cells. In the periphery of the liver lobule, the reactions for non-specific esterase and acid phosphatase were found in cytolysosomes, which may indicate their role in the degenerative processes of cells as well as in the differentiation of hepatocytes into oval cells.

4445 SIMULTANEOUS OCCURRENCE OF TOXIC HEPATITIS AND STEVENS-JOHNSON SYNDROME FOLLOWING THERAPY WITH SULFISOXAZOLE AND SULFAMETHOXAZOLE. *(E.)* Shaw, D. J. (Baltimore City Hosp., Md.) and R. P. Jacobs. *Johns Hopkins Med J* 126(3):130-133, 1970.

A case report is presented of a 25-yr-old woman who suffered acute focal hepatitis and Stevens-Johnson syndrome following ingestion of sulfisoxazole and sulfamethoxazole. The patient had also been taking an oral contraceptive (ethynodiol diacetate, 2 mg with mestranol, 0.1 mg) for 2 yr which was discontinued after the onset of symptoms. Upon hospitalization, she had an erythematous maculopapular eruption with central vesiculation and iris lesions involving the face, arms, trunk and upper thighs, which subsequently spread to both legs. There were vesiculo-bullous lesions on the buccal mucosa and a single large bulla involving the palpebral conjunctiva of the left eye. Values for serum bilirubin, SGOT, SGPT and alkaline phosphatase were: 8.4 mg/100 ml, 280 U, 440 U and 36.3 King-Armstrong units, resp. Percutaneous liver biopsy showed patchy areas of cell damage with pigmented macrophages, acidophilic bodies, neutrophilic and eosinophilic polymorphonuclear leuckocyte infiltration and bile stasis. After 20 days of treatment with prednisone, the patient was discharged asymptomatic.

4446 PATHOGENESIS OF METHIONINE-INDUCED TOXICITY. *(E.)* Hardwick, D. F. (Div. Pediat. Path., U. British Columbia, Vancouver, Canada), D. A. Applegarth, D. M. Cockcroft, P. M. Ross and R. J. Calder. *Metab Clin Exp* 19(5):381-391, 1970.

Intoxication with L-methionine, 10 mM/kg/day p.o. for 21 days, produced fatty liver, hypoglycemia, hypothermia, opisthotonus, and subsequently death in guinea pigs. Liver tissue samples from dead guinea pigs were characterized by lipid accumulation (primarily in periportal hepatocytes), decreased glycogen levels, severe hypoglycemia, and generalized aminoacidemia. Hepatic ATP progressively dropped to about 30% of control values in all methionine-fed animals sacrificed in the terminal state, probably related to binding of ATP by methionine, which formed increasing and substantial amounts of hepatocellular S-adenosylmethionine and S-adenosylhomocysteine. Adenine (administered at the same time animals were given L-methionine) prevented the development of a significant depression of blood sugar concentration seen in L-methionine fed controls and also prevented a decrease in hepatic ATP concentration.

4447 TRANSMEMBRANE POTENTIAL CHANGES IN LIVER CELLS FOLLOWING CCl_4 INTOXICATION. *(E.)* Smuckler, E. A. (Sch. Med. U. Washington, Seattle), J. R. Wands and W. J. Woodbury. *Amer J Path* 58(3): 499-508, 1970.

Hepatic cell transmembrane potential was measured by microelectrodes *in situ* in male Sprague-Dawley rats 0 to 72 hr following induction of carbon tetrachloride toxicity. Resting potentials in liver cells were -37.0 ± 5.7 mV (mean ± 1 S.D.) before carbon tetrachloride treatment. Mean resting potentials of liver cells did not change significantly from control values during the first 3 hr following administration of carbon tetrachloride while between 3 and 27 hr there was a progressive depolarization reaching a minimum value of -11.4 ± 3.4 mV in 24 hr, followed by a subsequent recovery to control levels by 72 hr. The narrow range of values recorded in control and poisoned livers suggested that a uniform alteration in all cells occurred.

4448 ACUTE GRANULOMATOUS HEPATITIS DUE TO HISTOPLASMOSIS. *(E.)* Lanza, F. L. (U. Texas M. D. Anderson Hosp., Houston), R. S. Nelson and B. N. Somayaji. *Gastroenterology* 58(3):392-396, 1970.

A 54-yr-old man presenting with fever, hepatomegaly, and weight loss had acute histoplasmosis, apparently involving only the liver. The diagnosis was established by culture of liver biopsy material and elevated complement fixation titers which declined in the convalescent phase of the patient's illness. Histological examination showed only granulomatous hepatitis. The patient recovered uneventfully without the use of systemic antifungal drugs although he received corticosteroids for a brief period. The patient now has been followed for 3 yr and remains well and a recent liver biopsy showed only minimal periportal lymphocytic infiltration. A review of the literature failed to reveal a similar case. An analysis was drawn between this case and the acute self-limited pulmonary form of histoplasmosis. Culture of liver biopsy material showing granulomatous hepatitis is recommended in all cases where the etiology is not clear from other evidence.

4449 EFFECTS OF CHRONIC CHLOROQUINE TREATMENT ON LYSOSOMES OF RAT LIVER CELLS. *(E.)* Abraham, R. (Albany Med. Coll., New York) and R. Hendy. *Exp Molec Path* 12(2):148-159, 1970.

Liver cells of male albino and black hooded rats were subjected to histological and ultrastructural studies following single daily doses via stomach tube of 40 mg/kg of chloroquine for 6 months. Examination of the chloroquine-treated rats showed a continuous process of autophagy by lysosomes, resulting in the formation of myeloid bodies and their extrusion into sinusoids and capillaries. Considerable acid phosphatase activity was observed in the rough endoplasmic reticulum, but not in the myeloid bodies. Primary lysosomes were rarely seen. There was single cell necrosis in the midzonal region of the liver lobule. Liver sections from rats sacrificed 3 months after drug treatment had been disc- tinued revealed no evidence of myeloid bodies, i dicating that the drug effect is reversible. The mechanism of autophagy, consequent sequestration of damaged membranes, and their extrusion into e traparenchymal spaces may be an important factor i preventing liver damage and chloroquine may act primarily on lysosomal membranes.

4450 INHIBITION OF SOMAN-INDUCED ENZYME BIO-SYNTHESIS IN RAT LIVER BY ETHIONINE. *(G* Domschke, W. (Physiol. Chem. Inst. U. Gottingen, Germany), G. F. Domagk, S. Domschke and W. D. Erdmann. *Arch Toxic* 26(2):142-148, 1970.

4451 HEPATOTOXICITY OF NITROSTIGMINE (E 605 FORTE) AND OBIDOXIME (TOXOGONIN) IN DO *(Ger.)* Boelcke, G. (Inst. Pharm. Toxic. U. Gottingen, Germany) and J. W. Gaaz. *Arch Toxic* 26(2):93-101, 1970.

4452 EFFECTS OF SOMAN AND DIISOPROPYLFLUOROPHOSPHATE UPON THE ENZYME BIOSYNTHESIS I RAT LIVER. *(Ger.)* Domschke, W. (Physiol. Chem. I U. Gottingen, Germany), G. F. Domagk, S. Domschk and W. D. Erdmann. *Arch Toxik* 26(1):76-83, 1970

4453 THE HEPATO-PROTECTIVE ACTION OF A SULP CALCIUM HYDROMINERAL AGENT (CACIULATA) LIVER LESIONS DUE TO LEAD POISONING. *(It.)* Banc T. (Timisoara Inst. Med., Rumania), L. Georgescu Z. Sirbu, C. Constantinescu and M. Banciu. *Mine Med* 61(20):966-970, 1970.

4454 FINE STRUCTURAL CHANGES OF THE LIVER CE OF RATS ADMINISTERED WITH KANECHLOR (CHLORINATED DIPHENYL COMPOUND). *(Jap.)* Tomio, N (Kumamoto U. Med. Sch., Japan). *J Kumamoto Med S* 43(12):973-986, 1969.

4455 ETIOPATHOLOGIC AND THERAPEUTIC ASPECTS OF ANGIOPATHY AND HEMORRHAGIC DIATHESI IN CHRONIC ALCOHOLISM. *(It.)* Madeddu, A. (G. Antonini Hosp., Limbiate, Italy) and A. Sovera. *Arch Sci Med* 126(8):490-499, 1969.

4456 CLINICAL AND MORPHOLOGICAL OBSERVATIONS O TWO CASES OF JAUNDICE FROM BUTAZOLIDIN COMPOUNDS. *(It.)* Coltorti, M. (Inst. Path. Spec Med. Method. Clin. U. Naples, Italy), L. Cuccurullo and C. Del Vecchio-Blanco. *Policlini* 77(10):309-324, 1970.

4457 MICROBIAL HEPATITIS IN NEWBORN INFANTS *(Fr.)* Martin, Cl. (Ctr. Neonatal Path Bordeaux, France). *Rev Pediat* 6(2):65-76, 1970.

8 RUPTURE OF LIVER CAUSED BY EXPLOSIVE CHARGE. (*E.*) Salonen, I. S. (Satakunta
ntral Hosp., Pori, Finland). *Ann Chir Gynaec Fenn*
(3):249-251, 1969.

59 ALCOHOL AND LIVER DAMAGE IN THE GASTRECTOMIZED PATIENT. (*It.*) Dal-Co, C. (United
. Hosp. St. John and Paul, Venice, Italy) and
A. Cristina. *Clinica* 29(2):77-92, 1969.

60 THE ULTRASTRUCTURE OF HEPATIC CELLS POISONED WITH LIGHTING GAS. *(Pol.)*
talski, M. (Acad. Med., Lublin, Poland) and A.
wlowska. *Pat Pol* 20(4):391-396, 1969.

61 THE EFFECTS OF N-CHOLYL AND N-DEHYDROCHOLYLAMINO ACIDS ON THE EXPERIMENTAL LIVER
JURIES. (*Jap.*) Kaneko, H. (Dainippon Pharmaceut.
., Osaka, Japan), T. Kadokawa and S. Aonuma. *J
armaceut Soc Jap* 90(2):169-175, 1970.

62 THE EFFECT OF VARIOUS VITAMINS AND CYSTEINE ON THE EXPERIMENTAL ALCOHOLIC
PATIC INJURY. (*Jap.*) Kanda, M. (Kumamoto U. Med.
h., Japan), Y. Itsuno, T. Hashimoto and M.
ahoshi. *J Kumamoto Med Soc* 43(12):1029-1032, 1969.

63 RESISTANCE OF HUMAN LIVER TO FATTY INFILTRATION IN SPITE OF EXCESSIVE ETHANOL IN-
STION. (*Sp.*) Iturriaga, H. (Hosp. San Borja, U.
ile), G. Ugarte and I. Insunza. *Rev Med Chile*
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64 MANAGEMENT OF TRAUMATIC LIVER INJURIES. *(Fr.)* Thepaut, L. (no affil), A. Vairet
d J. Vittori. *Rev Corps Sante Armees* 10(6):689-
5, 1969.

465 SERUM GLYCOPROTEIN IN CASE OF LIVER INJURY AND OF EXPERIMENTAL LIVER INFLAMMATION.
er.) Feher, J. (3rd Med. Clin. U. Budapest,
ngary) and L. Jakab. *Z Ges Inn Med* 25(1):33-36,
970.

466 LIVER MORPHOLOGY AND HISTOCHEMISTRY FOLLOWING ALCOHOL ADMINISTRATION. *(Ger.)*
erres, H. H. (Physiol. Inst. U. Bonn, Germany),
. G. Goslar and K. H. Jaeger. *Acta Histochem* 35(1):
73-185, 1970.

4467 INDIVIDUAL MANAGEMENT OF INFLAMMATORY LIVER DISEASES. *(Ger.)* Bruhl, W. (State Hosp. Korbach, Germany). *Med Klin* 65(4):162-165, 1970.

4468 ELECTRON MICROSCOPIC ALTERATIONS OF THE RAT LIVER FOLLOWING ORAL ADMINISTRATION OF LYNESTRENOL. *(Ger.)* Bartok, I. (Path. Inst., U. Szeged, Hungary), L. Varga and G. Varga. *Acta Hepatosplen* 17(1):1-10, 1970.

4469 GRISEOFULVIN IN MICE: LIVER HISTOLOGY. *(Ger.)* Bosse, K. (Gottingen, Germany) and A. Dust. *Arch Klin Exp Derm* 237(1):193-197, 1970.

4470 LIVER INJURY FOLLOWING HEART SURGERY. *(Ger.)* Rastan, H. (U. Surg. Clin. Gottingen, Germany). *Thoraxchirurgie* 17(6):499-503, 1969.

4471 ALTERATIONS OF THE FATTY ACID COMPOSITION OF LIVER MICROSOME LIPIDS IN CARBON TETRACHLORIDE EXPOSED RATS. *(It.)* Comporti, M. (Inst. Path. Gen., U. Pisa, Italy), E. Burdino and G. Ugazio. *Boll Soc Ital Biol Sper* 45(9):700-703, 1969.

4472 LIVER INJURY AND LIPID METABOLISM. I. EXPERIMENTAL CHOLESTASIS IN THE RAT: PLASMA LIPIDS, BILIRUBIN AND ENZYME ACTIVITIES. *(Ger.)* Kattermann, R. (Med. U. Clin. Gottingen, Germany), R. Worner, G. Brunner and W. Hunstein. *Acta Hepatosplen* 17(1):36-47, 1970.

- P:Morph (3827) (3836)
- P:Secr:Hepatobil (3937) (3974)
- Diagproc (4031) (4034) (4068) (4070) (4072) (4081)
- D:Livbil (4400) (4402) (4404) (4433)
- D:Livbil:C.Hep (4497)
- D:Gen (4644) (4651)

Acute Viral Hepatitis

4473 AUSTRALIA ANTIGEN AND VIRAL HEPATITIS: A BRIEF REVIEW AND A PRELIMINARY AUSTRALIAN REPORT. *(E.)* Ferris, A. A. (Fairfield Hosp., Victoria, Australia), J. Kaldor and C. R. Lucas. *Pathology* 2(1):1-8, 1970.

Immunodiffusion methods were used to test for the presence of Australia antigen in sera from Australian patients (antibody-containing sera for these tests were obtained from Melbourne hemophiliacs). When antigen was detected its specificity was verified using a reference human anti-Australia (1) serum supplied by Blumberg. All antigen-containing sera detected gave reactions of identity with one another and with an Australia-antigen positive serum tested by Blumberg. Australia antigen was detected in 5 of 10 patients with post-transfusion hepatitis, in 3 of 93 patients with acute viral hepatitis unrelated to transfusion, in 2 of 17 patients with chronic hepatitis, in 8 of 32 institutionalized with Down's syndrome, in 1 member on the staff of a dialysis unit, but in none of 121 control sera.

4474 HEPATITIS PRODUCED BY COXSACKIEVIRUS B1 IN ADULT MICE. *(E.)* Minkowitz, S. (St. U. New York Downstate Med. Ctr., Brooklyn) and S. Berkovich. *Arch Path* 89(5):427-433, 1970.

Hepatitis, pancreatitis and splenitis were readily produced in castrated and non-castrated adult male and female Charles River CD-1 mice by a single i.p. injection of 0.1 ml of coxsackie virus B1. The animals were killed three days after injection. In the noncastrated animals, massive liver necrosis occurred in 73% of the males but in only 9% of the females. Coxsackie virus B1 titers in the male liver were 23 times higher than those of the females. In the castrated animals, massive liver necrosis occurred in 19% of the males and in 23% of the females and the coxsackie virus B1 titers were similar in the liver of male and female castrates. Pancreatitis was equally severe in both sexes and resulted in destruction of most of the exocrine portions of the pancreas; high coxsackie virus titers occurred in pancreas of both sexes.

4475 INTESTINAL CONTENTS IN PATIENTS WITH VIRAL HEPATITIS AFTER A LIPID MEAL. *(E.)* Modai, M. (Tel-Hashomer Govt. Hosp., Israel) and E. Theodor. *Gastroenterology* 58(3):379-387, 1970.

The intestinal contents of 8 patients with viral hepatitis and 5 control patients without liver disease were collected after a lipid meal. Total lipid concentration in the intestinal contents did not differ significantly in the two groups. Bile acid concentration was significantly lower in the hepatitis group (4.2 ± 3.9 mmoles/liter) than in the controls (12 ± 4.4 mmoles/liter) and unconjugated bile acids were not found in samples from any of the patients. The concentration of lipids in the micellar phase, obtained by centrifugation, was significantly lower in patients with hepatitis (1.7 ± 1.3 mg/ml) than in controls (5.0 ± 4.7 mg/ml). All parameters varied considerably between patients and between collections in individual patients however, the total volumes collected and total lipid concentrations in the intestinal contents were not significantly different in the hepatitis and the control groups, despite these variations. The micellar lipid concentration was below 1.8 mg/ml in 2 of 3 patients with hepatitis and steatorrhea and was 2.0 mg/ml in the third patient and in patients with hepatitis and without steatorrhea, the values for micellar lipid concentration were above 2.4 mg/ml.

4476 LOCATION OF BILE PIGMENTS IN THE LIVER AND ITS SIGNIFICANCE IN THE COURSE OF VIRAL HEPATITIS. *(E.)* Pavel, I. (Cantacuzino Hosp., Bucarest, Rumania), H. Bonaparte and A. Petrovici. *Rev Roum Med Intern* 5(6):315-321, 1969.

The location of bile pigments in the liver was studied by electron microscopy in 3 patients (2 men, 1 woman) with viral hepatitis. In the first patient, there were minimal lesions of the liver cell and bile pigments were absent within the cell There were marked alterations in the Disse-bile canaliculi (various changes in shape with the presence of a granular electron dense material in the lumen) which appeared to be related to the onset of jaundice. In the second patient, lesions were seen in the liver and the cell membranes delimiting the Disse-bile canaliculi intercellular spaces were very thin and finely traced; there was an opaque material in these spaces that appeared to be pigment grains. Large clusters of granular pigments surrounded by a membrane could also be detected in the cells. In the third patient, numerous tight junctions were observed along the intercellular spaces, alternating with dilatation of these spaces which appeared as an optical void. Pigment granules were observed in the Disse's spaces. The presence of pigment in the bile canaliculi in the third patient was difficult to interpret owing to the blocking of the intercellular spaces by closure of the tight junctions. In studies of experimental fulminant jaundice with rapid development of cellular lesions in the rabbit, massive diffusion of pigments (appearing as large, homogenous masses) were observed in the cells resulting in alterations of the cells, the intercellular spaces and the bile canaliculi.

4477 SERUM HEPATITIS AT HENRY FORD HOSPITAL, 1958-1967. *(E.)* Murthy, K. S. (Henry F Hosp., Detroit, Mich.) and B. M. Schuman. *Henry F Hosp Med J* 18(1):57-64, 1970.

The risk of hepatitis related to transfusions of whole blood or blood fractions was determined by a investigation of the records at the Henry Ford hospital for the period, 1958-1967. During this peri 180 cases of serum hepatitis were recorded; 162/18 cases were related to transfusions, and 148/162 we transfused at this hospital. Approximately 129,73 units of whole blood and blood fractions were tran fused in these 148 patients, giving an overall inc dence of 1.13 cases per 1000 units transfused. Whi

lood had been given to 78% of the 148 patients. In
ne total group of 162 transfused patients (82 male,
) female; 17-89-yr-old) with serum hepatitis, there
ere 12 deaths (7.4%) but in 8/12 patients hepatitis
as considered mild or only moderately severe and
ot the immediate cause of death. In 55% of the 162
atients, 1-5 transfusions were given, in 65% blood
eplacement for surgery was the indication for blood
ransfusion, in 16.6% hemorrhage was the indication,
nd in 2 patients rubella prophylaxis and hemophilia,
esp., were the indications.

478 ASYMPTOMATIC CHRONIC HEPATITIS: COR-
RELATION BETWEEN ISOLATED SERUM TRANS-
MINASE ABNORMALITY AND LIVER BIOPSY. *(E.)* Levine,
. A. (Brooklyn-Cumberland Med. Ctr., New York)
nd L. Ranek. *Gastroenterology* 58(3):371-378,
970.

erum SGOT and/or SGPT, bromsulfalein (BSP) reten-
ion and serum bilirubin and α-globulin levels were
easured in 4 healthy men and 12 asymptomatic
ubjects followed 9 months to 7.5 yr after clinical
ecovery from acute viral hepatitis (transmission
f hepatitis was by the parenteral route in 8/12
ubjects, including narcotics use in 4). Serum
ransaminases fluctuated between normal (SGOT,
0U and SGPT, 35U) and abnormal in all 12 subjects
t some time during the follow-up study. Serum
-globulin (normal = 0.62 to 1.10 g/100 ml) and
SP retention (normal = less than 5% 45 min after
5 mg/kg dose) were increased in 3 and 5 subjects,
esp. Abnormal serum transaminase was positively
orrelated on biopsy with mild periportal inflam-
ation (triaditis) in all 12 subjects and triaditis
as associated with slight parenchymal necrosis in
subjects. Restriction of activity and prednisone
herapy did not reduce abnormal serum transaminase
evels. Isolated elevation of serum transaminase
n asymptomatic persons after recovery from hepa-
itis may be associated with portal triaditis,
ndicative of incomplete healing.

4479 REPRODUCTION OF EXPERIMENTAL HEPATITIS IN
DOG PUPPIES. *(Rus.)* Kerimzade, K. G. (no
ffil), M. L. Bershchansky, L. I. Alekperova, A. B.
hekhtman and Sh. R. Kadymov. *Vop Virus* 15(1):88-
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4480 PROGRESS REPORT: HEPATITIS-ASSOCIATED
(AUSTRALIA) ANTIGEN. *(E.)* Sherlock, S.
Roy. Free Hosp., London, England). *Gut* 11(2):185-
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4481 ENDOVENOUS MHV-3 INDUCED MOUSE HEPATITIS:
RHYTHM OF VIRUS OCCURRENCE IN THE LYMPHO-
ODULES AND IN THE BONE MARROW. *(It.)* Lista, D.
Clin. Infect. Dis., U. Naples, Italy), M. Visconti,
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5(6):323-325, 1969.

4482 EARLY LYSOSOMAL DAMAGE IN MHV-3 INDUCED MOUSE HEPATITIS. *(It.)* DiSimone, A. (Inst. Path. Spec. Med. Methodol. Clin. U. Naples, Italy), R. Greco, M. Carrella and M. Coltorti. *Boll Ist Sieroter Milan* 48(5):437-442, 1969.

4483 THE ENDOVENOUS TOLBUTAMIDE TEST IN THE ICTERUS AND RECOVERY STAGES OF VIRAL HEPATITIS. *(It.)* Morgano, G. (Civ. Hosp. Ventimiglia, Italy), S. Mazzone, A. Murratore and E. Patrone. *Arch Maragliano Pat Clin* 25(6):431-438, 1969.

4484 LYSOSOMAL MEMBRANE ALTERATIONS IN THE EARLY STAGES OF MHV-3 INDUCED MOUSE HEPATITIS. *(It.)* Greco, R. (Inst. Path. Spec. Med. Methodol. Clin., U. Naples, Italy) and M. Carrella. *Boll Soc Ital Biol Sper* 45(6):330-332, 1969.

4485 PORPHYRIN METABOLISM IN VIRAL HEPATITIS: PRELIMINARY NOTE. *(It.)* Piazza, M. (Clin. Infect. Dis., U. Naples, Italy), G. Giusti, L. Pecora, M. Visconti, S. Caccuri and F. DeRitis. *Boll Soc Ital Biol Sper* 45(6):321-323, 1969.

4486 VIRAL HEPATITIS: STATISTICAL REVIEW OF 348 CASES RECORDED AT THE "MANUEL ASCUNCE DOMENICH" PROV. HOSP. *(Sp.)* Quirantes Hernandez, A. J. (Prov. Hosp. Manuel Ascunce Domenech, Camaguey, Cuba) and A. L. Mendez Romero. *Rev Cubana Med* 8(1-2-3):131-141, 1969.

4487 ANALYSIS OF GAMMA-GLOBULIN PROPHYLAXIS IN THE FOCI OF VIRAL HEPATITIS. *(Cz.)* Masar, J. (Higher Inst. Epidemiol. Microbiol., Bratislava, Czechoslovakia), G. Pucekova and L. Stukovsky. *Cesk Epidem* 18(5-6):325-336, 1969.

4488 CONSEQUENCES OF VIRAL HEPATITIS: PERSONAL OBSERVATIONS. *(Pol.)* Bodzinska, I. (Bieganski Hosp., Warsaw, Poland) and B. Tkacz. *Wiad Lek* 22(23):2111-2115, 1969.

4489 RELAPSE EPIDEMIOLOGY IN VIRAL HEPATITIS. *(Rum.)* Telniceanu, A. (Dept. Epidemol., IMF., Bucarest, Rumania). *Med Intern* 21(12): 1491-1502, 1969.

4490 ADMINISTRATION OF GLUCURONOLACTONE TO INFECTIOUS HEPATITIS PATIENTS: METABOLIC EFFECTS. *(Rum.)* Dragomirescu, M. (Clin. Inf. Dis., Timisoara, Rumania). *Med Intern* 21(12): 1477-1480, 1969.

4491 VIRAL HEPATITIS: THE SITE OF BILE PIGMENT IN THE LIVER. *(Fr.)* Pavel, I. (Bucarest, Rumania), H. Bonaparte and Al. Petrovici. *Rev Int Hepat* 19(6):379-392, 1969.

4492 VIRAL HEPATITIS IN PREGNANCY. (*Por.*) Shiroma, M. (Fac. Med. U. San Paulo, Brazil), R. U. Hutzler, L. G. De Alcantara, J. A. Meira, J. M. Ferreira and V. A. Neto. *Rev Hosp Clin Fac Med San Paulo* 24(6):349-360, 1969.

4493 VIRAL HEPATITIS: EPIDEMIOLOGY AND PROPHYLAXIS. *(Fr.)* Bordes, M. (no affil), J. Kernen, H. Canayer and J. Larribaud. *Hopital* 57(804):805-809, 1969.

4494 THE XYLOSE CONCENTRATION TEST IN PATIENTS WITH INFECTIOUS HEPATITIS. *(Ger.)* Meissner, D. (Carl Gustav Carus Med. Acad., Dresden, Germany), F. Renger, K. U. Schentke and W. Naas. *Deutsch Gesundh* 15(8):350-354, 1970.

4495 FANCONI'S ANEMIA FOLLOWING VIRAL HEPATITI *(Ger.)* Wallnofer, H. (Vocklabruck Hosp., Germany) and K. Tauber. *Med Klin* 65(4):159-161, 19

4496 LONG-TERM INVESTIGATIONS IN THE PROGNOSIS OF VIRAL HEPATITIS. *(Ger.)* Franken, F. (State Hosp., Dusseldorf, Germany). *Med Klin* 65(4) 175-176, 1970.

- Diagproc (4014)
- D:Livbil (4400) (4404) (4414)
- D:Livbil:A.Nonv.Hep (4467)
- D:Livbil:Cirrh (4517)

LIVER AND BILIARY TRACT

Chronic Hepatitis

4497 ASPARTIC ACID IN THE TREATMENT OF CHRONIC HEPATITIS. *(E.)* Fodor, O. (Inst. Med. Res., Cluj, Rumania), F. Barbarino and S. Cotul. *Rev Roum Med Intern* 6(6):375-384, 1969.

Experimental investigations and therapeutic studies were performed over a 12-yr period on the effects of aspartic acid in chronic hepatitis patients and in toxic hepatic lesions induced by CCl_4 in rats. After perfusion with sodium aspartate, almost all patients showed improvement in their general condition, relief of asthenia, return of appetite, reduction of dyspepsia and hepatomegaly, a weight gain and increased diuresis. In addition there was a decrease in serum iron by 21.41%, SGPT by 28.72% and SGOT by 29.77%. Protein synthesis was increased, in particular serum cholinesterase (28.07%), serum albumin (8.5%) and serum prothrombin (10.68%). Serum bilirubin was decreased by 37.09% while bilirubinocholia was increased by 27.12%. In CCl_4-treated rats given aspartic acid infusions, there was a lower increase in serum transaminase activity (-23%) and of glutamate dehydrogenase (-27%). The increase of the serum enzyme activity and the decrease of hepatic tissue enzymes were much lower in the rats after aspartic acid administration. Tissue necrosis was limited and regeneration and restriction of connective tissue proliferation were stimulated. Radioisotope studies showed improvement of altered methionine metabolism by aspartic acid in both toxic CCl_4 hepatitis and patients with chronic hepatitis.

4498 A SEMI-QUANTITATIVE ANALYSIS OF SERUM IMMUNOGLOBULINS IN INDIVIDUALS AFFECTED BY CHRONIC LIVER DISEASE. (*Sp.*) Lobo-Parga, G. (Hosp. St. John of God, Santiago, Chile), V. Del Solar, V. Martinez, C. Simon and S. Villanueva. *Rev Med Chile* 97(9):605-613, 1969.

4499 FUNCTIONAL ALTERATIONS OF THE THYROID: ANTITHYROID ANTIBODIES IN CHRONIC LIVER DISEASES. *(Ger.)* Rohr, J. (Med. Acad. Lubeck, Germany), H. Uthgenannt and J. Weinreich. *Acta Hepatosplen* 17(1):26-36, 1970.

4500 AZATHIOPRINE IN CHRONIC HEPATITIS. *(Ger.* Danieli, G. (no affil), P. R. Dalmonte and M. Montroni. *Munchen Med Wschr* 112(12):503-50 1970.

4501 THE BIOLOGICAL INDICATIONS OF EXTERNAL DRAINAGE OF THE THORACIC DUCT IN THE TREATMENT OF INTESTINAL HEMORRHAGE DUE TO CHRONIC LIVER DISEASE. *(It.)* Bevilacqua, G. (Major Hosp. U. Milan, Italy), V. DiCarlo,A. Martinotti, E. Bessi and F. Muzzana. *Minerva Chir* 25(3):153-166, 1970.

4502 ACTIVE CHRONIC HEPATITIS. *(E.)* Mistilis S. P. (U. California San Francisco Med. Ctr.) and C. R. B. Blackburn. *Amer J Med* 48(4):48 495, 1970.

4503 LACTASE ACTIVITY IN CHRONIC LIVER DISEAS *(Ger.)* Bohmer, R. (Ctr. Int. Med., U. Ulm., Germany) and K. Rommel. *Z Gastroent* 8(2):10 110, 1970.

- Diagproc (4068) (4082)
- D:Livbil (4402) (4414) (4434)
- D:Livbil:A.Nonv.Hep (4467)
- D:Livbil:A.V.Hep (4473) (4478) (4496)
- D:Livbil:Cirrh (4512)

Cirrhosis

4504 KININS, KININOGEN AND KININOGENASE ACTIVITY IN PREGNANCY AND HEPATIC FAILURE. *(E.)* Carretero, O. A. (Fac. Med. Sci., Natl. U. Cuyo, Mendoza, Argentina), A. Nasjletti, A. Inon and R. S. Dohmen. *Amer J Med Sci* 259(3):182-186, 1970.

The concentration of kininogen and kinin in plasma and the kinin-forming capacity of acidified plasma (kininogenase activity) were determined in normal male and female subjects, in pregnant women and in patients with hepatic failure and ascites due to portal cirrhosis. Plasma kininogen levels were significantly lower in patients with portal cirrhosis (6.3 μg/ml) than in normal male subjects (8.3 μg/ml); however, there was no significant difference in kinin and kininogenase levels between cirrhotic patients and normal subjects. Plasma kininogen levels were significantly greater in pregnant women during the last gestational quarter (11.8 μg/ml) than in non-pregnant women (6.0 μg/ml). Plasma kinin and kininogenase activity was not significantly increased in pregnant women. Endocrine changes associated with hepatic failure may influence decreased kininogen production in hepatic failure.

4505 ANABOLIC STEROID EFFECT ON HEPATIC PROTEIN SYNTHESIS IN PATIENTS WITH LIVER CIRRHOSIS. *(E.)* Hirayama, C. (Fac. Med. Kyushu U., Fukuoka, Japan), N. Kimura and T. Masuya. *Digestion* 3(1):41-47, 1970.

The effect of short-term treatment with anabolic steroid on 7 male patients with compensated liver cirrhosis was assessed by a study of hepatic protein synthesis *in vitro*. The 7 patients were divided into 2 groups: 4 received 15 mg of methenolone and 3 received 6 mg of stanozolol p.o. every day. Following administration of anabolic steroids, the methenolone group showed an increased appetite and libido, but the stanozolol group did not. During the treatment, there was a decrease in BSP, thymol turbidity and zinc sulfate tests, and serum α-globulin, and an increase in serum albumin, cholesterol, and SGPT. Icterus index and alkaline phosphatase did not change significantly. The label of tricholoracetic acid (TCA) soluble fraction decreased and of TCA ethanol soluble fraction increased, suggesting that the hepatic nitrogen metabolism changed toward a normal pattern. The label of hot TCA soluble fraction and residue did not change significantly. Treatment had no effect on hepatic histology.

4506 BILE SALT SECRETION IN CIRRHOSIS OF THE LIVER. *(E.)* Turnberg, L. A. (Manchester Roy. Inf., England) and G. Grahame. *Gut* 11(2):126-133, 1970.

The possibility of abnormalities occurring in biliary secretion of bile salts into the duodenum during cirrhosis was investigated in 8 normal subjects, in 10 cirrhotic patients, and in 2 cholecystectomized patients. Duodenal juice was aspirated continuously through a double-lumen tube during an unstimulated period, after an i.v. injection of pancreozymin/cholecystokinin, and during a continuous i.v. infusion of secretin (3 U/kg/hr). Secretin produced a greater increase in the volume of duodenal juice in the cirrhotic patients than in the normal groups (49-57 mg/10 min compared with 28-49 ml/10 min). The bile acid response to pancreozymin/cholecystokinin followed by secretin in the cirrhotic patients (98-140 μmoles/10 min) resembled that seen in patients after cholecystectomy (105-128 μmoles/10 min) in whom pancreozymin/cholecystokinin induced only a slight increase in bile salt output but in whom the output of bile salts during rest and secretin stimulation was markedly greater than normal (15-34 μmoles/10 min). The total amount of bile salt liberated over 2 hr in the cirrhotic patients was the same as in normal subjects. The concentration of bile salt after pancreozymin/cholecystokinin was less than in normal subjects (4,447 μmoles/100 ml versus 1,939 μmoles/100 ml) but similar to that in cholecystectomized patients. There was a marked decrease in the deoxycholate conjugates and a reduction in the glycine: taurine ratio in the bile of cirrhotic patients (3:1 in normals, 1:1 in cirrhotics).

4507 GENERAL MEASURES IN CASE OF PORTAL HYPERTENSION. *(Ger.)* Pleiderer, Th. (Med. U. Clin. Heidelberg, Germany). *Ther Woche* 20(1):26-29, 1970.

4508 GLUCOSE OXIDATION AND GLUCOSE METABOLISM IN LIVER CIRRHOSIS. *(Ger.)* Adlung, J. (Med. Acad. Lubeck, Germany), U. Ritter and H. Uthgenannt. *Deutsch Med Wschr* 95(8):401-406, 1970.

4509 LIVER CIRRHOSIS: FATTY ACIDS AND STEROLS IN THE FECES. *(Ger.)* Erb, W. (1st Med. Klin. Frankfurt, Germany), R. Spira, J. Wildgrube and E. Bohle. *Klin Wschr* 48(5):303-310, 1970.

4510 PORTAL HYPERTENSION AND THE PROGNOSIS OF LIVER CIRRHOSIS. *(Ger.)* Kunath, U. (1st Med. Clin. U. Hamburg, Germany) and K. Becker. *Z Gastroent* 8(1):24-30, 1970.

4511 BLOOD PLATELET AGGREGATION IN LIVER CIRRHOSIS. *(Ger.)* Tilz, G. (Med. U. Clin. Graz, Austria) and S. Sailer. *Wien Z Inn Med* 51(1):1-6, 1970.

4512 PERCUTANEOUS LIVER PUNCTURE IN A CLINIC FOR HEART AND VASCULAR DISEASES. *(Ger.)* Weidemann, R. (no affil). *Med Klin* 65(14):656-661, 1970.

4513 EMERGENCY PORTACAVAL SHUNT IN THE MANAGEMENT OF SEVERE HEMORRHAGE IN A CIRRHOTIC PATIENT. *(Fr.)* Mathieu, P. (Surg. Clin. A, Nancy, France), G. Fieve and P. Chalnot. *Ann Med Nancy* 8(11):669-670, 1969.

4514 A HISTOPATHOLOGIC STUDY ON THE EFFECT OF ALCOHOL ON CIRRHOSIS AND HEPATOMA OF AUTOPSY CASES IN JAPAN. *(E.)* Sakurai, M. (Osaka U. Med. Sch., Japan). *Acta Path Jap* 19(3):283-314, 1969.

4515 EXTRACORPOREAL PORTOSYSTEMIC SHUNT AND TRANSUMBILICAL PORTAL HEPATOGRAPHY. (*Jap.*) Lin, J. S. (Kumamoto U. Med. Sch., Japan) and H. A. Fan. *J Kumamoto Med Soc* 43(12):1033-1035, 1969.

4516 HISTOLOGICAL EXAMINATION OF RENAL LESIONS ASSOCIATED WITH HEPATIC CIRRHOSIS IN ADOLESCENTS. *(It.)* Caldara, G. (Cantu Hosp., Italy). *Arch Sci Med* 126(7):447-453, 1969.

4517 TWO CASES OF SEVERE HEPATIC INSUFFICIENCY TREATED WITH PIG LIVER PERFUSION CROSS-CIRCULATION. *(Fr.)* Calamai, M. (CHU, Nancy, France), P. Sommelet, A. Larcan, F. Heully and R. Herbeuval. *Ann Med Nancy* 8(6):389-399, 1969.

4518 LIVER CIRRHOSIS WITH HEMORRHAGING ESOPHAGEAL VARICES: PORTACAVAL OR SPLENORENAL ANASTOMOSIS. *(Ger.)* Hoffmeister, H. E. (Surg. Clin. U. Gottingen, Germany), L. Brunner and J. Koncz. *Bruns Beitr Klin Chir* 217(8):697-702, 1969.

4519 ENZYME DETERMINATIONS AND OTHER FUNCTIONAL TESTS IN LIVER CIRRHOSIS. *(Pol.)* Drozdz, H. (2nd Clin. Int. Diseases, Cracow, Poland), A. Jedrychowski and M. Mysik. *Przegl Lek* 25(11): 739-745, 1969.

4520 HYPERTROPHIC OSTEOARTHROPATHY IN CIRRHOSIS OF THE LIVER. (*E.*) Guenter, C. A. (Dept. Med., U. Oklahoma, Oklahoma City) and J. Hammarsten. *Amer Rev Resp Dis* 101(4):590-594, 1970.

4521 REVERSIBLE FATTY LIVER WITH FIBROSIS FOLLOWING JEJUNOCOLIC SHUNT. (*E.*) Delena, S. A. (Methodist Hosp., Houston, Tex.), R. E. Fechner, H. Brown and E. L. Shelton, Jr. *Southern Med J* 63(4):399-402, 1970.

4522 DYNAMICS OF BLOOD SUGAR, INSULIN AND FREE FATTY ACIDS IN LIVER CIRRHOSIS. (*It.*) Zandomeneghi, R. (Inst. Clin. Med. Gen. Med. Ther., U. Modena, Italy), E. Sgarbi and R. Piva. *Minerva Gastroent* 15(4):191-194, 1969.

4523 PLASMA CLEARANCE AND DYNAMICS OF BILE BSP EXCRETION IN CHRONIC LIVER DISEASES. (*It.* Zeneroli, M. L. (Inst. Clin. Med. Gen. Med Ther., U Modena, Italy). *Progresso Med* 25(22):794-799, 1969

4524 THE CURRENT MANAGEMENT OF EDEMATOUS AND ASCITIC ALCOHOLIC LIVER CIRRHOSIS. *(Fr.)* Sovoye, B. (no affil) and C. Gayet. *J Med Lyon* (1177):1831-1841, 1969.

- P:Absorp (3875)
- Diagproc (4014) (4019) (4038) (4068)
- D:Stomduo:Peptulc (4215)
- D:Livbil (4374) (4400) (4402) (4404) (4414) (4433) (4434)
- D:Livbil:A.Nonv.Hep (4467)
- D:Livbil:A.V.Hep (4496)
- D:Livbil:C.Hep (4503)
- D:Gen (4616) (4618) (4651)

LIVER AND BILIARY TRACT

Gallbladder and Biliary Tract Diseases

4525 BILE, BACTERIA, AND BILIARY DISEASE. *(E.)* Goswitz, J. T. (Park Med. Ctr., Manitowoc, Wisc.). *Wisconsin Med J* 69(4):126-128, 1970.

Bile cultures were taken in 36 patients (11 men, 25 women; 5-77-yr-old, average 45.4 yr) undergoing surgery for biliary tract diseases. Infected bile was found in 22% of the patients. In 24 patients with chronic cholecystitis and cholelithiasis not associated with choledocholithiasis, only 4.2% had infected bile while in 8 patients with cholecystitis or biliary disease associated with calculi and a dilated ductal system 87.5% had infected bile. Coliform organisms were always present, and cephalothin was the best initial antibiotic. After sensitivity studies were reported, tetracycline was usually the drug of choice.

4526 THE ROENTGENOLOGIC APPEARANCE OF SCLEROSING CHOLANGITIS. *(E.)* Krieger, J. (Columbia-Presbyterian Med. Ctr., New York, N.Y.), W. B. Seaman and M. R. Porter. *Radiology* 95(2): 369-375, 1970.

Five cases of primary sclerosing cholangitis (a nonspecific, chronic low-grade fibrosing inflammatory reaction of the biliary system of unknown etiology) are presented. Although the diagnosis was usually evident from the gross appearance of the bile ducts, not all patients with this disorder had uniform involvement of the biliary system, so that inaccessible areas of involvement were only detected by operative cholangiography. The radiologic appearance of the extrahepatic ducts included strictures of variable length, most often without

roximal dilatation. Involvement of the intrahepatic
ucts was noted in all patients and was character-
zed by obliteration of the smaller biliary radi-
les, with luminal irregularities and beading of
he bile ducts. It was noted that certain slow-
rowing scirrhous carcinomas of the bile ducts may
imulate sclerosing cholangitis roentgenograph-
cally. Obstructive jaundice in patients with
lcerative colitis may result from unrelated
iliary disease or as a complication of an under-
ying condition such as pericholangitis, sclerosing
holangitis, and bile duct tumors. Combined use
f steroids and antibiotics has improved the prog-
osis of patients suffering from this disorder.

527 REGIONAL DISTRIBUTION OF HYPERPLASTIC
CHOLECYSTOSES IN THE GALLBLADDER WALL.
r.) Elfving, G. (U. Central Hosp., Helsinki,
inland), A. Palmu and K. Asp. *Ann Chir Gynaec*
enn 58(3):204-207, 1969.

istological studies were made of 344 gallbladders
emoved at cholecystectomy by taking specimens from
ach of 4 standard sites. Diffuse cholesterolosis
as demonstrated in all the specimens from 9.3% of
he cases and as a local condition in only a part
f the gallbladder wall in a further 9.3%. The
otal incidence of cholesterolosis was thus 18.6%
hich is double the figure generally reported in
he literature. Diffuse adenomyomatosis was estab-
ished in 6.4% (it was a local process in 2.9%) and
he total (9.3%) was also higher than that recently
eported in the literature. Primary mucosal hyper-
lasia was diffuse in 8.7% (local in 0.6%) and the
otal (9.3%) agrees with the frequency reported in
he literature. At clinical follow-up examination,
he disease picture of the cholesterolosis group
ithout calculi appeared to be unrelated to the ex-
ent of the histological changes. For the correct
iagnosis of cholecystoses, it is important to take
everal specimens for histological examination.

528 MINERAL WATER THERAPY OF CHOLELITHIASIS:
NEW CLINICAL EXPERIMENTAL STUDIES. *(Ger.)*
olominsky, J. (U. Polyclin., Prague, Czechoslov-
kia), M. Keelik and Z. Kral. *Arch Phys Ther* 21(5):
25-336, 1969.

529 DIAGNOSIS AND MANAGEMENT OF CHOLEDOCHUS
RUPTURES IN OBTUSE ABDOMENAL TRAUMA. (*Ger.*)
uhe, E. (Surg. Clin. Polyclin. U. Erlanger-Nuren-
erg, Germany) and K. Schwemmle. *Chirurg* 41(2):83-
5, 1970.

530 GALLBLADDER CARCINOMA: 100 CASES. (*Ger.*)
Nadjafi, A. (County Hosp., Basel, Switzer-
and) and M. Rossetti. *Praxis* 58(51):1692-1698,
969.

531 PATHOLOGY OF THE LIVER PARENCHYMA IN
CHOLELITHIASIS AND CARBOHYDRATE METABOLISM
ISORDERS. (*Ger.*) Baumgartl, E. (Dist. Hosp. Salz-
urg, Germany) and H. Steiner. *Wien Klin Wschr*
2(3):50-52, 1969.

4532 ACUTE AND CHRONIC CHOLECYSTITIS. (*Ger.*) Bohle, E. (1st Med. Klin. U. Frankfurt, Germany) and W. Siede. *Internist Prax* 9(4):613-622, 1969.

4533 GALLBLADDER OBSTRUCTION FOLLOWING PERCUTANEOUS LIVER PUNCTURE. (*Ger.*) Hubner, A. (Oscar Ziethen Hosp., Berlin, Germany). *Deutsch Gesundh* 24(50):2397-2399, 1969.

4534 A NEW PEPTIDE IN THE STUDY OF THE BILIARY PATHWAYS. *(It.)* Orlandini, I. (Carlo Poma Hosp., Mantua, Italy) and A. Agosti. *Radiol Med* 55(11):1061-1070, 1969.

4535 METAMPICILLIN IN THE PATHOLOGY OF THE EXTRAHEPATIC BILIARY PATHWAYS: BILIARY ELIMINATION AND SURGICAL AND POSTSURGICAL PROPHYLAXIS. *(It.)* Pellati, M. DeV. (Fatebenefratelli-Fatabenesorelle Ciceri Agnesi Hosp., Milan, Italy), F. Falcone and F. Perraro. *Minerva Med* 61(20): 946-952, 1970.

4536 RESIDUAL AND RELAPSE LITHIASIS OF THE MAIN BILE DUCT. *(Fr.)* Mouchet, A. (no affil). *Mem Acad Chir* 95(28-29):822-825, 1969.

4537 JEAN-LOUIS PETIT PHLEGMONS FOLLOWING BILE DUCT LESIONS. *(Fr.)* Desfosses, L. N. (no affil), G. Schulsinger, M. Nadal and G. Seriau. *Bull Mem Soc Chir Paris* 59(5):272-280, 1970.

4538 THE LIGAMENTUM TERES HEPATIS IN THE EXPLORATION OF THE BILE DUCTS AT THE PORTAL FISSURE LEVEL. *(It.)* Napolitano, A. (Inst. Path. Surg., U. Rome, Italy) and F. Zechini. *Ann Ital Chir* 45(5):823-838, 1969.

4539 ACUTE CHOLECYSTITIS CLINICAL AND THERAPEUTIC SCHEMES. *(Sp.)* Ferreira, J. A. (Buenos Aires, Argentina) and M. Meeroff. *Galicia Clin* 41(12):923-924, 1969.

4540 A NEW SURGICAL PROCEDURE IN THE MANAGEMENT OF EXTRAHEPATIC BILE DUCT ATRESIA. *(Sp.)* Roche, C. L. (Hosp. Roosevelt, Guatemala). *Rev Col Med Guatemala* 20(4):239-242, 1969.

4541 GALLBLADDER CARCINOMA. *(Sp.)* Gonzalez, A. M. (Oviedo, Spain). *Galicia Clin* 41(11):869-873, 1969.

4542 THE SYNDROME OF CHOLELITHIASIS. *(Por.)* Bhering, R. B. (Rio deJaniero, Brazil). *Brasil Med* 83(6):372-373, 1969.

4543 NEW SURGICAL TECHNIQUES FOR CONGENITAL ATRESIA OF THE BILIARY TRACTS. *(Pol.)* Bialowas-Wysocka, K. (Acad. Med., Warsaw, Poland). *Pol Przegl Chir* 41(12):1711-1716, 1969.

4544 INDICATIONS FOR SURGICAL PROCEDURES ON THE DUODENAL PAPILLA AND ON THE CHOLEDOCHAL SPHINCTER. *(Pol.)* Kortas, J. (1st Surg. Clin., Stellin, Poland), M. Parszewski, W. Kaczmarek and H. Zalewski. *Pol Przegl Chir* 41(12):1723-1726, 1969.

4545 A CASE OF CHOLEDOCHODILATATIO PERMAGNA. *(Pol.)* Bryc, S. (Acad. Med., Lublin, Poland), M. Zakrys and K. Plocka. *Wiad Lek* 22(21):1981-1983, 1969.

4546 RESULTS OF CHOLEDOCHODUODENOSTOMIES. *(Pol.)* Rypson, L. (Surg. Clin., Gruzlicy Inst., Poland) and Z. Bednarski. *Pol Przegl Chir* 41(12):1734-1739, 1969.

4547 CONSTRICTIVE EFFECT OF CHOLEDOCHAL SUTURES AND ITS PREVENTION BY AUTOPLASTY: AN EXPERIMENTAL STUDY. (*E.*) Bornemisza, G. (U. Med. Sch. Debrecen, Hungary) and G. Gyurko. *Acta Chir Acad Sci Hung* 10(4):387-391, 1969.

4548 EXPERIENCE WITH THE MANAGEMENT OF POSTOPERATIVE STRICTURES OF THE BILE DUCTS. (*E.*) Hastbacka, J. (U. Central Hosp., Helsinki, Finland), G. Elfving and K. Salmenkivi. *Ann Chir Gynaec Fenn* 58(3):208-212, 1969.

4549 BILIARY DUCT CYSTS: A SPECIAL PROBLEM OF BILIARY TRACT SURGERY. (*E.*) Hastbacka, J. (U. Central Hosp., Helsinki, Finland) and G. Elfving. *Ann Chir Gynaec Fenn* 58(3):213-218, 1969.

4550 OPERATIVE CHOLANGIOGRAPHY. (*E.*) Fraser, R. E. (Leduc, Alberta, Canada) and T. J. McNair. *J Roy Coll Surg Edinb* 15(2):111-113, 1970.

4551 CHOLEDOCHAL CYST: REPORT OF A CASE ASSOCIATED WITH HYPOPLASIA OF THE PROXIMAL COMMON DUCT AND ANOMALOUS INSERTION OF THE CYSTIC DUCT. (*E.*) Braasch, J. W. (Lahey Clin. Found., Boston, Mass.) and G. Douglas. *Aust New Zeal J Surg* 39(3):250-253, 1970.

4552 COMPLETE SEVERANCE OF THE COMMON BILE DUCT DUE TO BLUNT TRAUMA. (*E.*) Parkinson, S. W. (Roy. Perth Hosp., Australia). *Aust New Zeal J Surg* 39(3):253-254, 1970.

4553 THE ABSENT ADULT GALLBLADDER. (*E.*) Sherson, N. D. (Roy. Melbourne Hosp., Australia). *Aust New Zeal J Surg* 39(3):255-258, 1970.

4554 EMPHYSEMATOUS CHOLECYSTITIS: AN UNUSUAL FORM OF PRESENTATION. (*E.*) Boerema, W. (Roy. Perth Hosp., Perth, Australia) and R. A. McWilliam. *Aust New Zeal J Surg* 39(3):258-261, 1970.

4555 ACUTE CHOLECYSTITIS: TIME FOR SURGICAL INTERVENTION. (*E.*) Imamoglu, K. (Ankara Med. Sch., Turkey) and E. Gursel. *Acta Med Turcic* 6(2):115-119, 1969.

4556 PRIMARY SCLEROSING CHOLANGITIS. (*E.*) Duckler, L. (Bess Kaiser Hosp., Portland Ore.). *Radiology* 95(2):377-378, 1970.

4557 GALLBLADDER ADENOMYOMA AND ADENOMYOMATOS *(It.)* Montori, A. (Inst. Path. Surg., U. Rome, Italy), C. Zambianchi and G. Manini. *Ann Ital Chir* 45(5):839-864, 1969.

4558 GIGANTIC CYST OF THE CHOLEDOCHUS. *(It.)* Bartolomucci, E. (United Hosp. Child. Naples, Italy) and G. Di Iorio. *Riv Chir Pediat* 11(3):210-223, 1969.

4559 CONGENITAL ATRESIA OF THE BILE DUCTS. (*I* Righini, A. (United Hosp. Livorno, Italy *Riv Pediat Chir* 11(3):255-266, 1969.

4560 CONGENITAL ATRESIA OF THE BILE DUCTS: A STATISTICAL STUDY. (*It.*) Dodero, P. (G. Gaslini Inst., Genoa, Italy), B. Possenti, V. Rizz G. Gilli, R. Gusmano and A. Mezzano. *Riv Chir Ped* 11(3):313-320, 1969.

4561 IDIOPATHIC DILATATION OF THE CHOLEDOCHUS (*It.*) Bergami, F. (Infant Hosp. Bambino Gesu, Rome, Italy) and B. Ragni. *Riv Chir Pediat* 11(3):292-305, 1969.

4562 PRIMARY CARCINOMA OF THE GALLBLADDER. (*I* De Vivo, R. (Civ. Hosp. St. Leonardo, Naples, Italy) and G. M. De Rossi. *Rass Int Clin* 49(23):1494-1516, 1969.

4563 PATHOLOGY OF THE BILIARY TRACT: VII. PHYSIOPATHOLOGY AND CLINICAL FEATURES OF THE MAIN BILE DUCT IN CASE OF ACUTE CHOLECYSTITIS. (*It.*) Di Carlo, V. (Dept. Emerg. Gen. Surg. U. Milan, Italy), A. Martinotti and A. Randazzo. *Arc Ital Chir* 95(2):205-222, 1969.

4564 CHOLELITHIASIS IN SINGAPORE: II. A CLINICAL STUDY. *(E.)* Chiam, H. K. (Dept Path., U. Singapore), P. N. Unni and W. S. Hwang. *Gut* 11(2):148-152, 1970.

- P:Morph (3847)
- P:Motil (3896)
- Diagproc (4022) (4023) (4024) (4035) (4043) (4048) (4050) (4074) (4084) (4087) (4089)
- D:Livbil (4386) (4414) (4415) (4427)
- D:Livbil:A.Nonv.Hep (4472)
- D:Gen (4621) (4638)
- D:Gen:Parasit (4665) (4668) (4685)

65 INFECTIOUS MEGAENTERON OF MICE: I. MANIFESTATION AND PATHOLOGICAL OBSERVATION.
.) Muto, T. (Dept. Vetr. Sci., Natl. Inst. Hlth.,
kyo, Japan), M. Nakagawa, Y. Isobe, M. Saito,
Nakano and K. Imaizumi. *Jap J Med Sci Biol*
(6):363-374, 1969.

hitherto unknown disease (provisionally named
gaenteron) which occurred in a mouse colony of
Y strain, causing death in a number of sucklings,
reported. Two to three week old sucklings were
st frequently and severely affected, but mice after
aning acquired gradual resistance to the disease as
ey grew older and no fatal cases were usually ob-
rved in these animals; lactating mothers were
metimes severely affected when they had sick babies.
thological examination revealed thickened walls in
ther or both of the jejunum and colon. The lesions
the small intestine were characterized by an in-
eased number of villi, a replacement of the villus
lls due to the hyperplasia of the crypt type cells
er the epithelium, a formation of the thickened
cosal folds and a paucity or lack of the inflamma-
ry reactions in any layers of the intestinal wall.
aracteristic figures of the large intestine were
most the same as those of the small intestine, ex-
pt that a marked decrease was observed in the number
goblet cells.

66 INFECTIOUS MEGAENTERON OF MICE: II. DETECTION OF COLIFORM ORGANISMS OF AN UNU-
AL BIOTYPE AS THE PRIMARY CAUSE. *(E.)* Nakagawa,
(Dept. Vetr. Sci., Natl. Inst. Hlth., Tokyo,
pan), R. Sakazaki, T. Muto, M. Saito, T. Hagiwara
d K. Imaizumi. *Jap J Med Sci Biol* 22(6):375-382,
69.

liform bacilli of an unusual biotype were isolated
equently from the intestinal tract (colon, jejunum
d duodenum) and sometimes from the liver and
leen of mice affected with a new diarrheal dis-
se (megaenteron). The bacilli were isolated from
arly all affected mice older than 2 weeks old
d from some healthy mice but was not isolated
om mice less than 1 week old. A fatal diarrheal
sease, indistinguishable clinically and patho-
gically from megaenteron, developed in 1-to-4-
ek-old mice 8 to 10 days after p.o. innoculation
th coliform bacilli (4-week-old mice were not
fected as severely as 1-week-old mice). Bac-
ria-free filtrate of the intestines of diseased
ce did not produce megaenteron-like disease
llowing p.o. innoculation into 1-week-old mice.

67 STUDIES ON TRYPTOPHAN METABOLISM IN PROTEIN-CALORIE MALNUTRITION. *(E.)* Abbassy
S. (Fac. Med. Alexandria U., U. A. R.), M. M.
itoun, E. A. Hassanein, G. A. Abdel-Tawab, T. S.
olief and S. W. El-Sewedy. *Trans Roy Soc Trop*
d Hyg 64(1):148, 155, 1970.

ildren suffering from kwashiorkor with and without
rmatosis (9 and 6 cases, resp.), marasmus (9 cases),
d 7 male controls of the same age group were evalu-
ed with respect to basal values and to their ability
metabolize a loading dose of 0.5 g L-tryptophan
with and without vitamin B_6 supplementation, to study the metabolism of tryptophan along the formylkynurenine pathway. Significantly higher levels of all determined metabolites (indoxyl-sulphate, anthranilic acid glucuronide, anthranilic acid, o-aminohippuric acid, N-acetylkynurenine, kynurenine, 3-hydroxykynurenine, kynurenic acid and xanthurenic acid) were found in the basal urine of children with marasmus. Children with kwashiorkor without dermatosis excreted significantly higher amounts of anthranilic acid glucuronide, anthranilic acid, o-aminohippuric acid and kynurenine than controls while children with kwashiorkor with dermatosis excreted significantly more of these metabolites as well as more kynurenic acid, acetylkynurenine and xanthurenic acid. Tryptophan loading caused retention of most metabolites in children with each malnutrition syndrome, especially in those with marasmus. Niacin and pyridoxine deficiency was detected only in children with kwashiorkor with dermatosis. The increased basal values of metabolites may be due to renal dysfunction or defective tissue utilization or both. The difference in excretion patterns observed in the various syndromes may be related to the variable factors controlling the serum and urine levels of amino acids.

4568 SEROEPIDEMIOLOGIC STUDIES DURING A SIMULTANEOUS EPIDEMIC OF INFECTION WITH EL TOR OGAWA AND CLASSICAL INABA *VIBRIO CHOLERAE*. *(E.)* Bart, K. J. (Pakistan-SEATO Cholera Res. Lab., Dacca), Z. Huq, M. Khan and W. H. Mosley. *J Infect Dis* 121(supp.)m:S17-S24, 1970.

The pattern of infection and the disease caused by the El Tor Ogawa *Vibrio cholerae* and by the classical Inaba *Vibrio cholerae* were studied in 73 families during a simultaneous epidemic of both biotypes in Chittagong, East Pakistan. Of the 73 families, 56 (76.7%) were infected with El Tor Ogawa and 17 (23.3%) had classical Inaba. The 73 families contained 247 family contacts having El Tor Ogawa and 74 having classical Inaba. Fifty-three percent of El Tor Ogawa and 57% of classical Inaba participating contacts were less than 15 yr of age. Of 47 patients with El Tor Ogawa tested for paired sera, 38 (80.9%) had a 4-fold or greater rise in vibriocidal titer. Of 16 patients with classical Inaba and tested serologically, 12 (75%) had a 4-fold or greater rise in vibriocidal titer. The overall infection-to-case ratio in El Tor Ogawa contacts was 36:1, compared with 4:1 for the classical Inaba family contacts. The overall infection rates among family contacts were the same for both biotypes (46%), but the contacts infected with El Tor Ogawa had a frequency of secondary hospitalized cases that was 8 times lower.

4569 STUDIES ON EXPERIMENTAL PROTEIN MALNUTRITION: IV. EFFECT OF THREONINE DEFICIENCY ON SOME ASPECTS OF LIPID METABOLISM IN RATS. *(E.)* Wilfred, G. (Christian Med. Coll., Vellore, India) and T. N. Sekhara Varma. *Indian J Biochem* 6(4):175-179, 1969.

Lipid (triglycerides, cholesterol, phospholipids, unesterified fatty acids) metabolism in blood and liver was studied in rats force-fed either complete diet containing all essential nutrients or a threonine-deficient diet for 3 days. Total lipid and triglyceride levels in the livers of threonine-deficient rats (77.13 mg/g liver and 76.14 mg/liver, resp.) were higher than in the livers of rats fed a complete diet (55.06 mg/g liver and 25.87 mg/liver, resp.). No significant change occurred in phospholipid or cholesterol content or in serum lipid composition in rats fed a threonine-deficient diet. Triton experiments revealed that lipid accumulation in threonine-deficient rats was not due to an impairment of hepatic triglyceride secretory mechanism. Threonine deficiency did not impair the ability of isolated liver mitochondria to oxidize octanoate but the *in vivo* incorporation of [2-^{14}C] acetate and [^{14}C] glucose into hepatic lipids indicated stimulation of fat synthesis. The fatty liver induced by threonine deficiency may be due to stimulation of hepatic fat synthesis rather than to depression of fatty acid oxidation or failure to secrete triglycerides into the plasma.

4570 THE 1968-1969 CHOLERA-VACCINE FIELD TRIAL IN RURAL EAST PAKISTAN: EFFECTIVENESS OF MONOVALENT OGAWA AND INABA VACCINES AND A PURIFIED INABA ANTIGEN, WITH COMPARATIVE RESULTS OF SEROLOGICAL AND ANIMAL PROTECTION TESTS. *(E.)* Mosley, W. H. (Pakistan-SEATO Cholera Res. Lab., Dacca), W. E. Woodward, K. M. A. Aziz, A. S. M. M. Rahman, A. K. M. A. Chowdhury, A. Ahmed and J. C. Feeley. *J Infect Dis* 121(supp.):S1-S9, 1970.

In a field trial in East Pakistan in 1968 monovalent whole-cell Ogawa and Inaba vaccines, and a purified Inaba antigen, were tested to determine the degree of protection induced by these vaccines against infection with the Inaba serotype of *Vibrio cholerae*. Tests of antigenicity for humans were carried out on groups of 20 infants or young children who received 2 doses of 0.2 ml each of the test vaccines or of a reference NIH vaccine, at an interval of 1 month. Blood was collected for vibriocidal titrations by microtechnique 7 days after the second inoculation. The monovalent Inaba vaccine and the purified Inaba antigen gave excellent protection in the first cholera season, 3 months after inoculation. Inaba vaccine was 80% effective in the children aged 0 to 4 years, and 100% effective in children aged 5 to 14 years, while Inaba antigen was 87% effective in the younger group and 100% effective in the older group of children. The monovalent Ogawa vaccine was ineffective against Inaba cholera; however, recipients of the Ogawa vaccine did develop substantial anti-Inaba vibriocidal antibody titers. Vaccine-induced protection against cholera apparently depends on the development of type-specific immunity.

4571 MAGNITUDE AND DURATION OF ANTITOXIC RESPONSE TO HUMAN INFECTION WITH *VIBRIO CHOLERAE*. *(E.)* Pierce, N. F. (Baltimore City Hosp., Md.), J. G. Banwell, R. B. Sack, R. C, Mitra and A. Mondal. *J Infect Dis* 121(supp.):S31-S35, 1970.

The circulating antitoxic and antipermeability factor response was studied in serum samples taken at varying intervals from 16 male patients recovering from infection with *Vibrio cholerae*. Nine patients received tetracycline (500 mg. p.o., every 6 hr f 48 hr) on day 1 or 2 of onset of cholera; 5 were treated with tetracycline on days 5 through 7; an 2 received no drug treatment. The antitoxin tite of the 16 patients at admission time were uniform low (1-15 units/ml), rose 9-fold (from 3.4 to 31 units/ml) by day 15, and fell slowly afterwards. The mean titer at 12-18 months for 6 patients was still 6-fold above titers on day 1. Geometric me titers of antipermeability factor rose and fell i parallel with serum antitoxin, and showed a simil wide range in convalescent titers. Patients receiving early treatment with tetracycline had a geometric mean peak antitoxin titer of 16 units/m (range: 1-100 units/ml), while patients treated later in the course of the disease, or untreated, had an antibody titer peak of 137 units/ml (range 33-520 units/ml). Antipermeability factor peak f patients treated on day 1-2 of the disease with tetracycline exhibited a geometric mean value of units/ml (range: 3-126 units/ml), and patients treated later or untreated had a mean peak readin of 161 units/ml (range: 85-245 units/ml). There was a significant direct relation between the pea titers of antitoxin, the antipermeability factor, and the duration of diarrhea associated with infe-tion.

4572 IMMUNOGLOBULINS AND ANTIBODY ACTIVITY I THE INTESTINE AND SERUM IN CHOLERA: II MEASUREMENT OF ANTIBODY ACTIVITY IN JEJUNAL ASPIR AND SERA OF CHOLERA PATIENTS BY RADIOIMMUNODIFFUS *(E.)* Northrup, R. S. (Pakistan-SEATO Cholera Res Lab., Dacca) and S. A. Hossain. *J Infect Dis* 121(supp.):S142-S147, 1970.

Radioimmunodiffusion was used to detect and semiquantitate antibody activity (anti-*Vibrio cholera* in immunoglobulins (IgA, IgG, and IgM) in jejunal aspirates and serum of cholera patients. Antibod activity (anti-IgA, anti-IgM and anti-IgG) was de onstrated in the jejunal aspirates at some time during the course of cholera while in serum, a se ondary type of response was noted, with anti-IgG and anti-IgM activity tending to rise early in th course of the disease. Serum anti-IgA activity r only after *V. cholerae* had disappeared from the i testine. The correlation of the appearance of Ig antibody with the disappearance of *V. cholerae* fr the intestine suggested that *V. cholerae* antigen present in the intestine absorbs all the availabl IgA antibody, allowing none to be detected in the serum.

4573 IMMUNOGLOBULINS AND ANTIBODY ACTIVITY I THE INTESTINE AND SERUM IN CHOLERA. *(E.* Northrup, R. S. (Pakistan-SEATO Cholera Res. Lab. Dacca), J. Bienenstock and T. B. Tomasi, Jr. *J Infect Dis* 121(supp.):S137-S141, 1970.

Immunoglobulins in cholera stool were examined by sucrose density-gradient ultracentrifugation and by Sephadex G-200 column Chromatography. IgG and IgM were present in cholera stool as molecular fragments probably resulting from enzymatic degradation of the molecules after secretion into the intestine. Secretory IgA was present in cholera ool, but significant amounts of IgA material of e size of serum IgA and smaller were also present. e evidence of proteolysis of IgG and IgM in the ool suggested that the smaller material reacting th anti-IgA antiserum could be the product of zymatic breakdown of the original secretory IgA lecule. The known resistance to digestion of cretory IgA, and the failure to detect any "piece" secretory component in the 7S portion of the phadex column eluate, suggested that some of the A molecules may have been secreted (without the cretory component) as monomeric 7S molecules.

74 SENSITIVITY OF AGGLUTINATING AND VIBRIOCIDAL ANTIBODIES TO 2-MERCAPTOETHANOL IN MAN CHOLERA. *(E.)* Sack, R. B. (Johns Hopkins U. r. Med. Res. Training, Calcutta, India) and C. B. rritt. *J Infect Dis* 121(supp.):S25-S30, 1970.

ute and convalescent sera obtained from 23 cholera tients and from 11 patients with noncholera diaheas were examined for agglutinating antibodies ainst *Vibrio cholerae* measured before and after eatment of the serum with 0.1 M 2-mercaptoethanol. o types of response were observed in the cholera tients. The majority (14 of 23) produced mainly mercaptoethanol-resistant antibody, and were condered to have a secondary pattern of immune reonse. The remaining 9 cholera patients produced ly small amounts of antibody, all of which was 2-rcaptoethanol-sensitive, thus demonstrating a imary type of immune response. Vibriocidal antidy titers determined on some of these patients owed the same patterns of antibody response. The nding that 2-mercaptoethanol-resistant antibody ters were low in the acute sera of cholera patients s compatible with findings from experiments in imals that have suggested that 7S antibody may be re important than 19S antibody in protection ainst cholera.

75 CONVALESCENT CARRIERS OF *VIBRIO CHOLERAE:* DETECTION AND DETAILED INVESTIGATION. *.)* Pierce, N. F. (Johns Hopkins U. Ctr. Med. s. Train., Calcutta, India), J. G. Banwell, S. L. rbach, R. C. Mitra and A. Mondal. *Ann Intern Med* (3):357-364, 1970.

gnesium sulfate purging and duodenal intubation re performed in 81 convalescent male cholera tients (14-73-yr-old) to detect prolonged *Vibrio olerae* infection. Three carriers were identified ving a prevalence of 3.7%, and the carrier state sted 50 to 331 days. Carriers were more frequently rsons over 50 yr and persons not receiving effecve antibacterial treatment. Cholera vibrios were equently isolated from duodenal fluid of carriers d consistently increased in numbers after galladder evacuation. After early convalescence, ools from carriers rarely yielded cholera vibrios, t purged stools induced by magnesium sulfate were equently positive. Rough forms of *V. cholerae* came the predominate type isolated from carriers ter 15 to 29 days of convalescence. In carriers e titers of agglutinating, vibriocidal, and otoxin neutralizing antibodies rose and fell in a pattern similar to convalescent, non-carrier patients. Convalescent carriers may be an interepidemic reservoir of *V. cholerae.*

4576 PROTECTIVE EFFECT ON INFECTIONS WITH *VIBRIO CHOLERAE* IN SUCKLING MICE CAUSED BY THE PASSIVE IMMUNIZATION WITH MILK OR IMMUNE MOTHERS. *(E.)* Ujiiye, A. (Inst. Trop. Med., Nagasaki U., Japan) and K. Kobari. *J Infect Dis* 121(supp.):S50-S55, 1970.

The protective effect of mother's milk immunized with heat killed bacilli (0.2 mg s.c.) of *Vibrio cholerae,* Inaba strain V86, against p.o. and i.p. cholera infection was studied in suckling ICR mice. Protection against p.o. and i.p. infection in suckling mice was observed following passive immunization due to immune milk but not when immunity was obtained by the transplacental route. Protection seemed to be produced by some constituents of the immune milk and partially by some agents excreted into the intestine of suckling mice after absorption of the immune milk through the intestinal wall. Moderate protection was observed in suckling mice fed immune milk secreted even a few days after the immunization of mothers. P.o. or i.p. infection was ascertained to be useful for studies of immunity against infections with *V. cholerae* as well as the pathogenesis of such infections.

4577 SIGNIFICANCE OF VIBRIOCIDAL ANTIBODIES WITH REGARD TO IMMUNITY TO CHOLERA. *(E.)* Gangarosa, E. J. (Natl. Commun. Dis. Ctr., Atlanta, Ga.), W. E. DeWitt, J. C. Feeley and M. R. Adams. *J Infect Dis* 121(supp.):S36-S44, 1970.

In order to determine whether vibriocidal antibodies were sufficiently specific to serve as epidemiologic markers to indicate recent or past exposure to *Vibrio cholerae* antigens, investigations were made of serum collected from 95 patients with brucellosis, 12 with tularemia, 12 with leptospirosis, 17 with shigellosis, and 112 with infectious hepatitis; serum was also collected from rabbits after exposure to a variety of bacteria suspected of sharing common antigens with *V. cholerae.* These blood samples were collected from patients in areas of the world not known to be infected with cholera. The vibriocidal test when used in concert with other serologic, bacteriologic, and epidemiologic data, proved to be a valuable tool for the study of cholera in endemic areas. High vibriocidal titers were not proof of exposure to the antigens of *Vibrio cholerae.* Vibriocidal antibodies in high titers were found in the sera of healthy individuals never exposed to cholera antigens and in patients recovering from brucellosis (in this disease, 4-fold or greater changes in vibriocidal titer were noted regularly). Rabbits inoculated i.v. with a variety of *Brucella* species or *Citrobacter* species, developed high circulating titers and had 4-fold changes in titer. *Brucella* cross-reacting vibriocidal antibodies were found to be protective against *V. cholerae* in mice, but the degree of protection did not correlate with the vibriocidal titer. The level of vibriocidal titers achieved after vaccination and the rapidity of this response were similar in persons with and without preimmunization vibriocidal antibodies.

4578 ARTHRITIS INDUCED WITH FREUND'S ADJUVANT AND ITS RELATIONSHIP TO CHANGES IN THE STOMACH, SMALL INTESTINE AND THYMUS. *(E.)* Julkunen, H. (U. Central Hosp., Helsinki, Finland) and P. Rokkanen. *Acta Rheum Scand* 16(1):22-29, 1970.

4579 TREATMENT OF AUTONOMIC GASTROINTESTINAL DISEASES. *(Ger.)* Hanycz, J. (Imperial Sanitorium, Carlbad, Czechoslovakia). *Munchen Med Wschr* 112(11):476-479, 1970.

4580 PSYCHOSOMATIC VIEWS ON DISEASES OF THE GASTROINTESTINAL TRACT. (*Nor.*) Dale, J. (Pharm. Inst., U. Bergen, Norway). *Nord Med* 83(13): 385-394, 1970.

4581 COMPLETE AVULSION OF THE COMMON BILE DUCT AS A RESULT OF BLUNT ABDOMINAL TRAUMA: CASE REPORT OF A CHILD. *(E.)* Caro, A. M. (Hosp. Gen. Asturias, Oviedo, Spain) and J. M. Ocana Losa. *J Pediat Surg* 5(1):60-62, 1970.

4582 LABILE PORTAL HYPERTENSION IN CRYPTOGENIC GASTRO-DUODENAL HEMORRHAGE. *(It.)* Staudacher, V. (Dept. Gen. Emerg. Surg., U. Milan), A. Randazzo, V. DiCarlo and A. Martinotti. *Minerva Gastroent* 15(4):195-204, 1969.

4583 FATAL SHIGELLOSIS IN INFANTS INFECTED WITH *SHIGELLA FLEXNERI* TYPE 2a. *(It.)* Squillaci, G. (Inst. Hyg., U. Catania, Italy) and C. Puglisi. *Policlinico* 77(13):420-423, 1970.

4584 OPTIMAL ANTIBIOTIC THERAPY IN CHOLERA. *(E.)* Wallace, C. K. (Johns Hopkins U. Sch. Med., Baltimore, Md.), P. N. Anderson, T. C. Brown, S. R. Khanra, G. W. Lewis, N. F. Pierce, S. N. Sanyal, G. V. Segre and R. H. Waldman. *Industr Med Surg* 39(3):137-141, 1970.

4585 SEVERE ESOPHAGO-GASTRIC HEMORRHAGES: TECHNIQUE, INDICATIONS AND RESULTS OF MODERATE VISCERAL REFRIGERATION. *(Fr.)* Levy, E. (Hosp. Rothschild, Paris, France), M. Malafosse, J. F. Charles and J. Loygue. *Ann Gastroent Hepatol* 6(1):69-86, 1970.

4586 THE SPECTRUM OF CHOLERA IN RURAL EAST PAKISTAN: I. CORRELATION OF BACTERIOLOGIC AND SEROLOGIC RESULTS. *(E.)* Woodward, W. E. (Pakistan-SEATO Cholera Res. Lab., Dacca), W. H. Mosley and W. M. McCormack. *J Infect Dis* 121(supp.):S10-S16, 1970.

4587 INTESTINAL MICROFLORA IN A CHRONIC CARRIE OF *VIBRIO CHOLERAE*. *(E.)* Gorbach, S. L. (Johns Hopkins U. Ctr. Med. Res. Train., Calcutta, India), J. G. Banwell, N. F. Pierce, B. D. Chatterj and R. C. Mitra. *J Infect Dis* 121(4):383-390, 197

4588 INDICATIONS FOR ANGIOGRAPHY IN HIGH DIGESTIVE HEMORRHAGES. *(Fr.)* Bennet, J. (Hosp Paris, France). *Ann Gastroent Hepatol* 6(1):57-63, 1970.

4589 HIGH ACUTE DIGESTIVE HEMORRHAGE IN EMERGENCY PATHOLOGY: CLINICAL DATA, ETIOLOG AND CLASSICAL RADIOLOGY. *(Fr.)* Rettori, R. (Hosp. Paris, France). *Ann Gastroent Hepatol* 6(1):43-55, 1970.

4590 EXTERNAL COMPRESSION OF THE CELIAC AXIS. *(Fr.)* Houdard, C. (Paris, France), J. F Carles, C. Helenon and P. Boschet. *J Chir* 99(1): 19-24, 1970.

4591 A CASE OF SECONDARY EXUDATIVE ENTEROPATH FOLLOWING CHANGES IN THE INTESTINAL LYMPHATICS. *(It.)* Paolucci, G. (Dept. Clin. Pediat, U. Bologna, Italy) and R. Lazzari. *Minerv Pediat* 22(2):76-82, 1970.

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4594 REMEDIAL OPERATIONS FOR POSTGASTRECTOMY SYNDROMES. (*E.*) Herrington, J. L., Jr. (Vanderbilt U. Sch. Med., Knoxville, Tenn.). *Curr Probl Surg* (April 1970):1-63, 1970.

4595 INTESTINAL HANDLING OF FLUID AND ELECTROLYTES: AN APPROACH TO THE PATHOGENESIS OF FLUID DIARRHEA. (*E.*) Sladen, G. (St. Bartholom Hosp., England). *Saint Bartholomew Hosp J* 77(4): 123-128, 1970.

4596 POTASSIUM THERAPY AND GASTROINTESTINAL LESIONS. (*E.*) Emerson, D. N. (Mead Johnson Res. Ctr., Evansville, Ind.). *S Dakota Med J* 23(4):25-30, 1970.

4597 MESENTERIC ADENITIS IN CHILDHOOD SIMULAT INTUSSUSCEPTION. (*E.*) Hadju, N. (St. George Hosp., London U., England). *Acta Radiol* 10(2):130-137, 1970.

4598 VISCERAL MANIFESTATION OF SHOCK IN CONGENITAL HEART DISEASE. (*E.*) Coen, R. (Child. Hosp., Cincinnati, Ohio) and A. J. McAdams. *Amer J Dis Child* 119(5):383-390, 1970.

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4601 TOWARD AN EFFECTIVE PROPHYLACTIC IMMUNITY TO CHOLERA. (*E.*) Burrows, W. (Dept. Microbiol., U. Chicago, Ill.). *J Infect Dis* 121(supp.): S58-S62, 1970.

4602 GASTROINTESTINAL SURGICAL EMERGENCIES IN THE NEWBORN INFANT. (*E.*) Talbert, J. L. (U. Florida Coll. Med., Gainesville), A. H. Felman and F. L. De Busk. *J Pediat* 76(5):783-797, 1970.

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4604 GASTROINTESTINAL HISTOPLASMOSIS IN CHILDREN. (*E.*) Soper, R. T. (U. Iowa Coll. Med., Iowa City), D. L. Silber and G. W. Holcomb, Jr. *J Pediat Surg* 5(1):32-39, 1970.

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4607 EXPERIMENTAL BACILLARY DYSENTERY IN RABBITS. (*E.*) Ogawa, H. (Dept. Path., Nat. Inst. Hlth, Tokyo, Japan) and A. Nakamura. *Jap J Med Sci Biol* 22(6):383-387, 1969.

4608 LYMPHORETICULAR NEOPLASMS OF THE GASTROINTESTINAL TRACT: CLINICAL AND ANATOMICAL OBSERVATIONS. (*It.*) Canino, V. (Inst. Anat. Path. Histol. U. Turin, Italy). *Cancro* 22(2):239-258, 1969.

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4613 GASTROINTESTINAL AMINO ACID LOSSES: A STUDY WITH I^{131}-L-TYROSINE. (*It.*) Barbara, L. (Inst. Path. Spec. Med. Methodol. Clin., U. Bologna, Italy), G. A. Lanfranchi, F. Addarii, G. Bazzoli, P. Azzaroli and P. Vezzadini. *Arch Ital Mal Appar Dig* 36(1-2):42-59, 1969.

4614 ETIOLOGY, PATHOGENESIS AND STATISTICS OF GASTRO-INTESTINAL DISEASES IN SEA WORKERS. (*It.*) Pusateri, G. (United Hosp., Naples, Italy). *Rass Int Clin Ter* 49(24):1538-1545, 1969.

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- P:Absorp (3872)
- P:Motil (3886)
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4659 CORRELATION OF CLINICAL, PARASITOLOGICAL AND SEROLOGICAL DATA OF INDIVIDUALS INFECTED WITH *ENTAMOEBA HISTOLYTICA*.

(E.) Kotcher, E. (Louisiana St. U. Med. Ctr., Shreveport), M. Miranda and V. Garcia de Salgado. *Gastroenterology* 58(3): 388-391, 1970.

Clinical, parasitological, and serological data were collected from 265 persons (neonates to 84-yr-old) infected with *Entamoeba (E.) histolytica*. In a series of 209 persons without gastrointestinal complaints, 153 were negative for *E. histolytica* in their feces, although only 8/153 (5.2%) were positive serologically by the indirect hemagglutination reaction. In these 209 persons, 56 were positive for the ameba coprologically and 9/56 were positive serologically (6 in low titer, 1 in medium titer, and 2 in high titers). In a group of 28 patients with a variety of mild, acute and/or chronic gastrointestinal complaints, 21 patients were positive and 7 were negative for *E. histolytica* by fecal examination. Of the 21 patients who were positive by stool examination, 4 were positive serologically (2 in low titer and 2 in medium titers) and of 7 patients who were negative, 1 was positive serologically in low titer. Of 15 dysenteric patients studied, 4 were negative by stool examination for *E. histolytica*, but 1 of these 4 had a positive serology in low titer; 11 of the patients positive by stool examination were also positive serologically, 5 in medium titers and 6 in high titers. Of 6 patients with hepatic abscess, 3 were positive by stool examination, but all 6 were positive serologically. The percentage of positive results with the indirect hemagglutination test was significantly greater than agar gel diffusion techniques in each category of cases except for the active hepatic abscess where it was the same for both types of tests.

4660 HEPATIC SINUSOIDAL LYMPHOCYTOSIS AND MALARIA IN RHESUS MONKEYS.

(E.) Voller, A. (London Sch. Hyg. Trop. Med., England), P. D. Marsden, D. S. Ridley, P. Suntharasamai, D. H. Connor and R. N. Rossan. *J Trop Med Hyg* 73(3):54-58, 1970.

Infections with *Plasmodium cynomolgi bastianellii*, *Plasmodium inui*, *Plasmodium shortti* and *Plasmodium knowlesi* were induced in Indian monkeys by the i.v. injection of infected citrated or heparinized blood, and the course of infections monitored by examination of thick and thin blood smears stained with Giemsa. Liver biopsies were performed and wedge biopsies taken at post mortem were compared with needle biopsy material. Hepatic sinusoidal lymphocytosis developed in 1 monkey infected with *Plasmodium inui* and in 2 infected with *Plasmodium knowlesi*. Fewer of the animals with chronic malaria infections developed the syndrome than those which were challenged on several occasions suggesting that the degree of repeated challenge to which human populations are exposed could affect the degree of development of hepatic sinusoidal lymphocytosis.

4661 A BIOCHEMICAL METHOD FOR THE DETECTION OF ANTHELMINTIC ACTIVITY AGAINST LIVER FLUKE.

(E.) Campbell, W. C. (Merck Inst. Ther. Res., Rahway, N. J.) and T. A. Barry. *J Parasit* 56(2):325-331, 1970.

Hepatic damage caused by immature *Fasciola hepatic* was investigated in Charles River rats in which SGOT concentration was used as the indicator of liver damage. In the first of 4 experiments, male rats were used, and females were used in the last 3. In the first 3 experiments, 30 metacercariae were placed deep in the esophagus of the animals, while only 15 metacercariae were used in the last experiment. In the first experiment, SGOT determinations were made at several intervals after inoculation; in the next 2 experiments, only one SGOT determination was made one week after treatment with fasciolicidal agents, and in the last experiment SGOT determinations were made one week after treatment. The concentration of SGOT was greatly elevated in rats examined 3 weeks after p.o. inoculation with 30 metacercariae each, and elevated to a lesser extent in rats given 15 metacercariae. Treatment of 3-week-old infections with several classes of known fasciolicidal agents (hexachlorophene, bithionol, oxyclozanide) resulte in a return to normal or near normal SGOT concentr tions within 1 week. The SGOT concentration did not decrease in rats treated with clioxanide, whic has been reported inactive against *F. hepatica* in the rat. Since there appeared to be a clear correlation between the reduction in SGOT and the time and dosage of anthelmintic treatment, it was suggested that the SGOT assay described would constitute a useful method for detecting compounds effective against liver flukes.

4662 PATHOGENETIC FACTORS IN EXPERIMENTAL BOVINE ESOPHAGOSTOMOSIS: V. INTESTINAL BLEEDING AS CAUSE OF ANEMIA.

(E.) Bremmer, K. C. (Long Pocket Lab. Indooroopilly, Brisbane, Australia). *Exp Parasit* 27(2):236-245, 1970.

Fecal blood loss from 13 calves experimentally infected with *Oesophagostomum radiatum* was measured using ^{51}Cr-labeled erythrocytes. Bleeding into the parasitized colon commenced 3 weeks after infection, at the time of the fourth larval ecdysis, and persisted for at least nine weeks. Maximum erythrocyte losses (mean 39 ± 14 ml packed erythrocytes/day) occurred during the seventh week afte infection and were associated with a mean worm burden of 2500 adult parasites. The mean value of the maximum daily erythrocyte losses expressed as percentage of the total red cell volumes was 3.5 ± 0.9% and a mean total red cell loss equivalent to 8.5 liters of jugular whole blood was estimated t have occurred between three and twelve weeks afte infection. Intestinal hemorrhage seemingly is the prime cause of the anemia associated with esophagostomosis and the major site of blood loss apparently is the colon.

4663 TISSUE REACTIONS TO *SCHISTOSOMA MANSONI* EGGS: II. DISTRIBUTION OF EGGS IN FECES AND AT DIFFERENT LEVELS OF THE INTESTINAL WALL, AT VARIABLE INTERVALS AFTER INFECTION.

(E.) Kloetzel K. (Fac. Med. Mogi das Cruzes, Brazil). *Trans Roy Soc Trop Med Hyg* 64(1):116-121, 1970.

The distribution of *Schistosoma mansoni* eggs in th feces and in various levels of the terminal ileum determined in 21 white mice infected with *S. mansoni* and killed at various intervals after exposure to approximately 100 cercariae. Granulomata or degenerated eggs were never found in the lamina propria. Regardless of the phase of infection, a constant proportion of 40% of the eggs found in the mucosa were mature, the remainder immature; 57% of the mature and 82% of the immature eggs were seen lying within the blood vessels, while others were lying free in the tissues surrounded by an area of necrotic or exudative reaction. Micro-abscesses occupying the entire length of the villi and deforming this structure were often seen, particularly during the early stages of infection. Between the 80th and 93rd day after infection, there was an abrupt increase in the proportion of eggs diverted to the subserosa and muscular layers; simultaneously, there was an increase in the intensity of the fibrotic reaction around eggs at these levels and in the submucosa and a sudden decrease in the number of eggs arriving at the mucosa (which resulted in a drop in egg excretion). Since most eggs in the stools were mature, it appears that this is not a passive process and that a histolytic enzyme secreted by the eggs aids elimination.

4664 A BIOCHEMICAL METHOD FOR THE DETECTION OF ANTIHELMINTHIC ACTIVITY AGAINST LIVER FLUKE (*FASCIOLA HEPATICA*). (*E.*) Campbell, W. C. (Merck Inst. Ther. Res., Rahway, N. J.) and T. A. Barry. *J Parasit* 56(2):325-331, 1970.

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4666 ECHINOCOCCOSIS OF THE LIVER: REPORT OF A CASE. (*E.*) Benedetti, R. (Mar del Plata, Argentina) and J. L. Ponka. *Henry Ford Hosp Med J* 18(1):39-48, 1970.

4667 ON THE MECHANISM OF EXPULSION OF HELMINTHS. (*E.*) Keller, R. (Dept. Derm. Med. Microbiol., U. Zurich, Switzerland). *Clin Exp Immun* 6(2):207-210, 1970.

4668 HUMAN FASCIOLIASIS IN IRAN: REPORT OF A CASE WITH *FASCIOLA HEPATICA* IN BILIARY DUCTS. (*E.*) Mohsenin, H. (Sch. Publ. Hlth., Tehran U., Iran) and M. A. Ebrahimi. *Bull Soc Path Exot* 62(5):871-874, 1969.

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4674 AMINOSIDIN SULPHATE IN THE TREATMENT OF LAMBLIASIS AND INTESTINAL AMEBIASIS. *(Por.)* Mazzantini, G. (no affil), E. Grunwald, E. M. Ribeiro, J. deP. Melo, Jr., L. R. Banci and V. F. Brunialti. *Rev Brasil Med* 26(11):682-684, 1969.

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4677 TREATMENT OF SYMPTOMATIC INTESTINAL AMEBIASIS WITH METRONIDAZOLE IN AN UPPER VOLTA HOSPITAL. (*Fr.*) Escalier, J. P. (Bobo-Dioulasso Hosp., Upper Volta) and J. Escalier. *Bull Soc Path Exot* 62(5):848-855, 1969.

4678 CYSTICERCOSIS IN MADAGASCAR. (*Fr.*) Andriamiandra, A. (Principle Hosp. Befelatanana, Tananarive, Madagascar), J. Cros, A. Dodin and E. R. Brygoo. *Bull Soc Path Exot* 62(5):894-899, 1969.

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4682 ANTIHELMINTIC ACTION OF *l*-TETRAMISOLE. *(Fr.)* Laigret, J. (Hosp. El-Maarouf, Comoro), M. Tourres and S. Boschi. *Bull Soc Path Exot* 62(4):734-740, 1969.

4683 A CASE OF LIVER TETRAMERIASIS IN A MONKEY. *(Fr.)* Vassiliades, G. (Nat. Vetr. Sch. Lyon, France), J. Euzeby and N. Grosjean. *Ann Parasit* 44(5):555-558, 1969.

4684 *SCHISTOSOMA INTERCALATUM* BILHARZIASIS DETECTED IN AFRICANS LIVING IN FRANCE. FIFTY YEARS OF PARASITOLOGY, CLINICS AND THERAPEUTICS. *(Fr.)* Barbier, M. (Int. Hosp. U. Paris, France). *Bull Soc Path Exot* 62(5):974-993, 1969.

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- P:Morph (3794)
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RECTUM

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